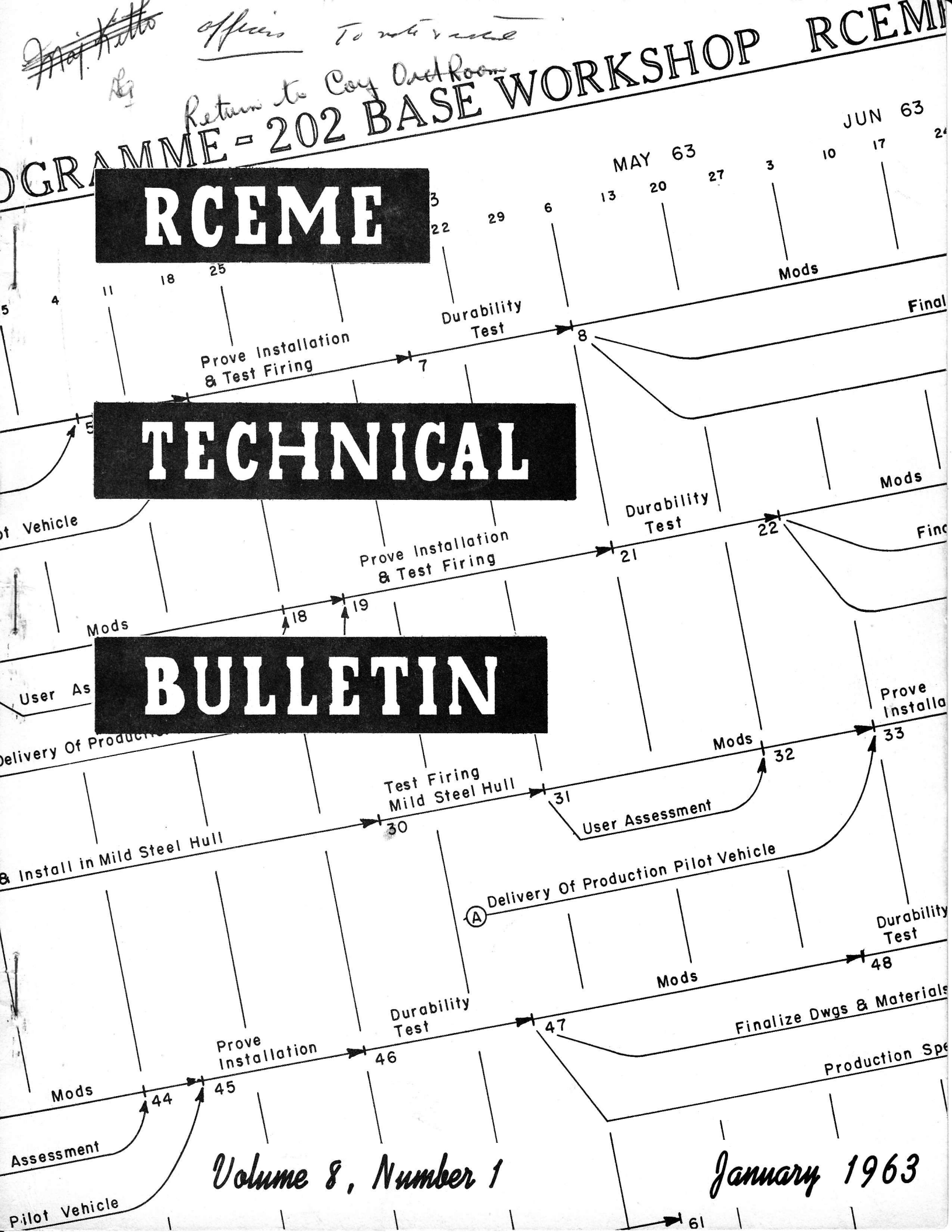

Volume 8, Number 1 January 1963

RCEME TECHNICAL BULLETIN

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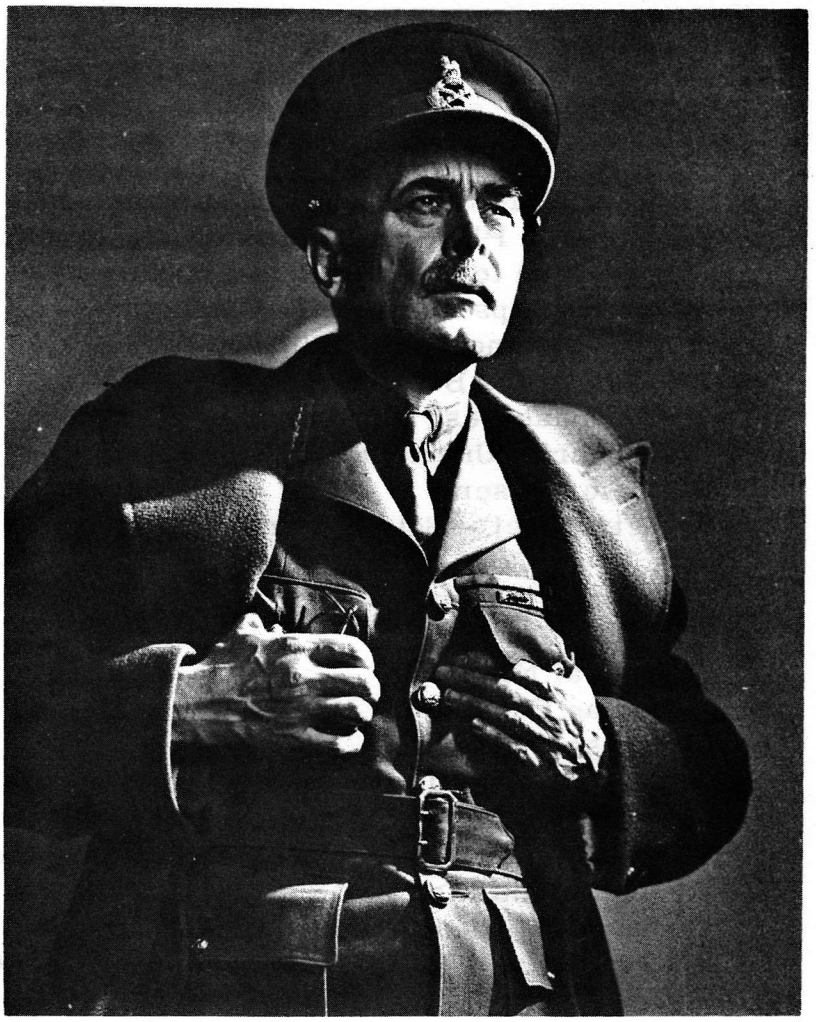
COVER: Portion of critical path diagram used in Bobcat SEV development at 202 Base Workshop.

DON'T MISS THIS!

ARROW DIAGRAMMING - See preface for news of a new series of articles on this subject beginning in this edition.

COLONEL COMMANDANT
THE CORPS OF ROYAL CANADIAN ELECTRICAL
AND MECHANICAL ENGINEERS



General The Honourable AGL McNaughton, CH, CB, CMG, DSO, CD

This publication is issued under the authority of Col A Mendelsohn, CD, Director of Electrical and Mechanical Engineering. The contents have been edited and approved by Lt Col CMR Elmsley, CD.

The Bulletin is published to assist RCEME personnel in keeping abreast of current trends and developments and to circulate interesting news about the Corps. The information and statements herein are not to be quoted as authority for action.

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General McNaughton – New Colonel Commandant

The appointment of General McNaughton to the newly-created post of Colonel Commandant of The Corps has just been announced.

After hearing that his appointment had been approved, the General, in a recent letter to the Director, wrote (in part): "May I say that in being the first to hold this appointment under the new arrangements I feel that I have been most specially honored. You may be sure I will do my best to help in every way which may be possible and I hope you will call on me as the occasion may indicate.

"I would be very grateful if you would convey to the members of The Corps, all Ranks, my very deep appreciation of the high honor which this appointment represents and my very great pleasure in the continuing association with them which it presents".

In this issue we present the first two articles of a series on "Critical Path Scheduling".

The first, by Maj KLF Coupland of the RCEME School, outlines the development of the general system and explains the mysterious groups of letters that have been coined to specify various modifications of the basic system.

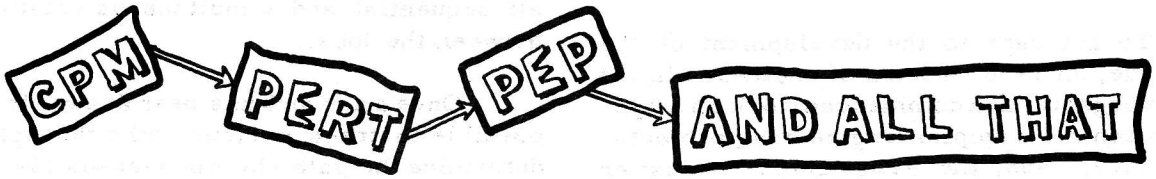
The second, by Col CW Jones Commandant 202 Base Workshop, introduces the technique of planning and producing the 'arrow diagram', the foundation of the system.

In succeeding issues, our contributors willing and able, we will present:

- Development of the Schedule and Determination of the Critical Path
- Application in a Workshop
- A Modified System Taught at RCSME, Chilliwack, BC

This scheduling system made its name in programming large and complex projects – the POLARIS development is probably the prime example. It has been used with success on large construction projects where cash flow, equipment and labour allocation, the input of subcontractors and many other activities had to be brought together in the right place at the right time. It is used at 202 Base Workshop; for instance, the BOBCAT SEV development program described in a previous issue of the Bulletin.

We believe it can be applied advantageously to many of our more normal workshop functions. We hope you will give this some thought.



by Major K L J Coupland

Recent years have seen the growth of charting techniques to such an extent that certain expressions are being used continually in every day conversation and in management literature, even though there appears to be some confusion as to how it all started.

The technique in question, of course, is known by the generic name of "Arrow Diagramming". It is known, also, by several other titles depending on the modifications made to the initial concept and the types of applications made. Some 30 odd names have been identified, which at one time or another have been used. For example, the Special Projects Office of the US Navy termed their initial study "Programme Evaluation Research Task", which was, of course, abbreviated to PERT. The present-day meaning of these initials is Programme Evaluation Review Technique. Other names which have been used at one time or another are, Programme Evaluation Procedure (PEP), which denoted the system used by the US Air Force; Critical Path Method (CPM); Least Cost Estimating and Scheduling; Scheduling Control and Automation by Network Systems; and Production Analysis Control Technique. This has led to what could only be called a jungle of terminology which has been confusing to management; and, regardless of the name used, the concept in each case is fundamentally the same. From the types of articles now appearing in various management journals, there seems to be a move to drop satellite terms and return to the basic designation of PERT.

Although the technique of Arrow Diagramming has only come into wide-spread use in the very last few years, the groundwork was laid many years ago. It might be interesting to discuss how Arrow Diagramming came about. In 1896 a Polish pioneer in the development of production management named Karol Adamiecki designed the "harmonogram", a graphic device for charting simultaneously numerous complicated operations with the intent of bringing harmony to a large number of production operations. The fundamental idea of the harmonogram is similar to that of the PERT network. However, his book was not available in English and never received much recognition.

Henry L. Gantt became famous for his development of the principles of the Gantt Chart. This he developed during World War One as a major contribution to the war effort. His work was expanded by a management consultant named Wallace Clark, who published a book in 1922 called the "Gantt Chart" which made possible the application of Gantt's ideas to improve planning and control methods. Again the principles of the Gantt Chart, with some refinements, form the basis for the Arrow Diagramming technique. Arrow Diagramming also draws on the techniques known as "line of Balance", and "Milestone Reporting Systems", which have been in use for many years. Similarly, the concept of task relationships and their graphic representation is drawn by inferential analysis from the network approach, which is found in electrical engineering and

fluid dynamics. The portions of Arrow Diagramming which can be called basic new creations are the "Time and Cost Concepts", the "Critical Path and the Dynamic Progress Reporting System".

To get back to the development of the technique, in 1956, a team of engineers in the Dupont organization commenced work on a system to control complex engineering projects. In January, 1958, the Programme Evaluation Research Task was originated in the Special Projects Office of the US Navy Bureau of Ordnance. The project team, which included members from the contractor, Lockheed, and the consultants, Booz, Allen & Hamilton, was directed to the research and development of improved methods for the planning and control of the complex Polaris Programme. The project was eminently successful and was responsible for this weapon project being completed two years ahead of schedule.

Meanwhile, Remington-Rand was working along the same lines, and with Dr. John W. Mauchly, developed their concept of Arrow Diagramming which was known as the "Critical Path Method" (CPM) of planning and scheduling. It might be interesting now to discuss the two principal versions of Arrow Diagramming - PERT and CPM. It is not intended, as this time, to go into the detailed "mechanics" of the two approaches. Both are based upon the five key aspects - the network, resource, allocation, time and cost considerations, network paths and critical path. It is perhaps in the derivation of the network that the two systems differ. The network is essentially an advance concept of a flow chart of the steps necessary to accomplish a given objective or task. It could be called a logistic plan for work coordination to achieve a definite objective. The network possesses three components: event, job or task, and relationships. An event is a clearly identifiable point in time which marks the beginning or completion of a specified task in the project.

A job or task is the work which must be accomplished after one event before the succeeding one can occur. Jobs are represented by arrows, and events will be shown at the heads and tails of arrows, either simply as a number, or alternatively as a number surrounded by a circle or a hexagon.

Events and jobs in the network will show all sequential and simultaneous relationships between the jobs.

Once a network has been drawn, it is then possible to trace various paths through it and determine the path which possesses the longest elapsed time between start and finish of the project. This path is known as the Critical Path.

The basic difference between CPM and PERT appears to be in the approach used. The PERT approach may be termed "event oriented" with the emphasis on the intersection of job arrows. Hence, the PERT system comes into its own in complex research and development programmes where thousands of sub-contractors are involved and is, of course, developed primarily for computer application. Also, in research and development work, estimates of job times must be made based on the statistics available.

On the other hand, the CPM tends to be job oriented with the main events being calculated after the job oriented network has been developed.

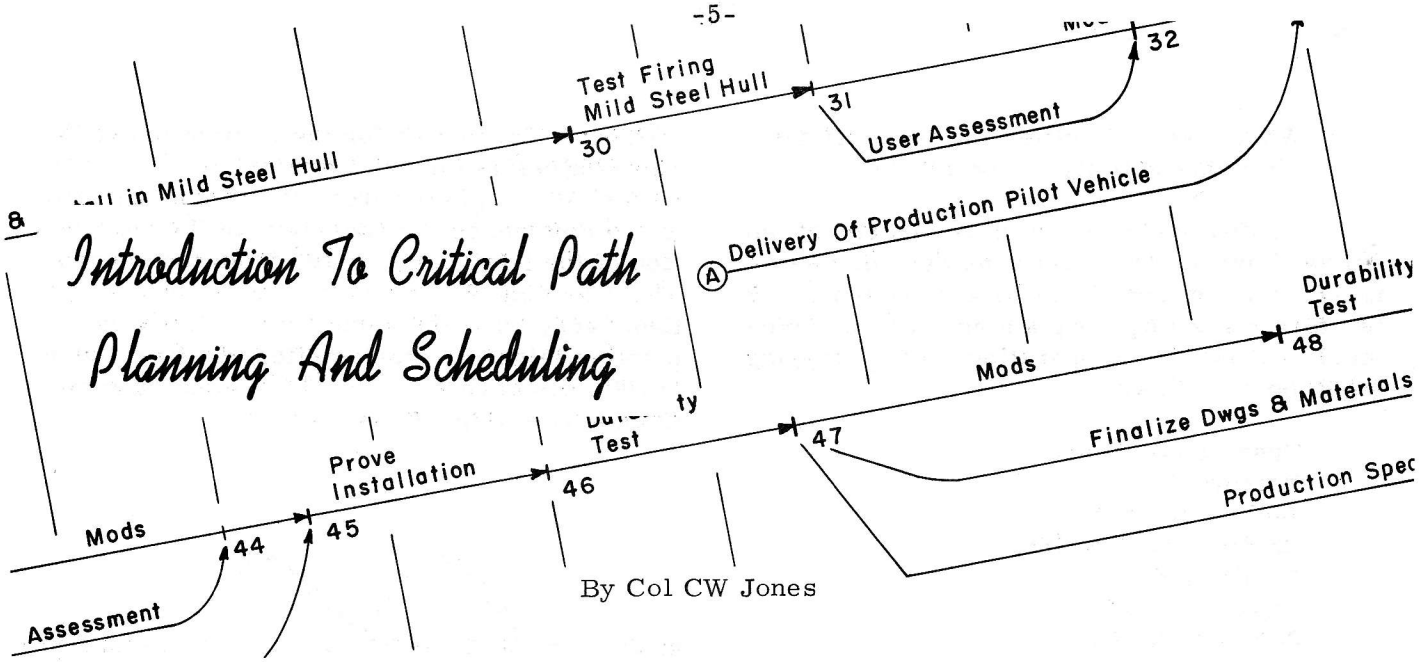
A choice between the systems depends upon the needs of the organization involved, and the following factors should be considered:

a. Is the organization 'event' or 'job' oriented?

b. Will it be used for establishing and controlling job costs? If 'crashing' is to be done on a job, it is obviously easier to work on a job arrow rather than an event number.

c. Will statistic methods of estimating produce more accurate estimates than those which can be obtained from personnel who supply the computed data?

d. Are there military or other needs which specify the use of one of the other systems?



Introduction To Critical Path Planning And Scheduling

By Col CW Jones

The Critical Path method of planning and scheduling provides a means of determining the ordered sequence of a complex operation and presenting it in a readily understood graphical form, as well as assembling data suitable for an electronic computer solution.

The method separates planning from scheduling and establishes a sound discipline that will ensure all activities or operations of a plan are considered and properly related. This order is established by the development of an arrow diagram in which each activity is represented by an arrow. These arrows are connected in such a manner that they will show the interrelationship of all activities in a project.

Each activity or operation which is represented by an arrow has a duration time which may be varied by the application of equipment and/or manpower and the cost curve of the activity varies with this application. The lowest point of the curve is considered the normal cost and the related duration time as the normal time.

When the arrow diagram has been completed, the sequential interrelationship of all activities is clearly portrayed and it is possible to study the project as a whole. In addition to this, since the normal duration times of all activities are available, it is possible by computation to establish the "critical path". This may be completed by feeding the data into an electronic computer or by a more laborious "sharp pencil" process. The computer is certainly preferable for large projects and is particularly helpful when cost studies are required under various combinations of manpower and equipment.

In developing an arrow diagram for a project, the first thing to do is to list all those activities which must take place in order to complete the project. While it is not essential, it is helpful to list these activities as closely as possible to the order in which they will take place. The normal duration of time for each activity could also be added at this time.

On the completion of the listing of activities, the planner will then draw an arrow to represent the first activity. This arrow is not to any particular scale nor does it have any polar qualities. All that need be remembered about it is that it represents an activity and that time is increasing throughout its length, eg, the head of the arrow represents a time which is later than the time represented by the tail of the arrow. With the consideration of each activity and the drawing of the associated arrow, the planner must ask himself the following questions:

a. Is there any activity which should be completed before this activity can start?

b. What other activities can be carried out at the same time as this activity?

c. What other activities cannot start until after this activity is completed?

To demonstrate the development of an arrow diagram we might consider the operations evolving from a flat tire experienced by two men travelling along a highway in an automobile. The list of operations after stopping might be as follows:

Open up car trunk.
Remove the jack.
Jack up the car.
Remove the flat tire.
Fit the spare tire.
Lower the car.
Stow the flat tire.
Replace jack.
Close the trunk lid.

By employing the arrow diagram and studying the interrelationship of the operations and employing two men, we might produce the following solution:

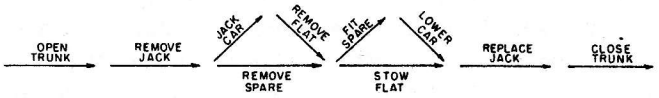


Figure 1

In addition to the normal arrow per activity, multiple arrows may be employed. Multiple arrows are an innovation used to display the introduction of a new activity while the original activity is still in process. An example of this might be the manufacture of a large quantity of one item for the modification kit. We will consider the following three operations on the one item:

Shearing
Punching
Painting

Provided machines and manpower are available, it would be wasteful of time to wait until the complete quantity of items were sheared before the punching started and, likewise, uneconomical to wait for the completion of the punching before the painting started. We might consider a plan whereby the punch operator would commence his operation on the completion of the first batch of 100 from the shears. The punching and shearing operations would then carry on at the same time; similarly the painting might be started after the first batch of 100 units were punched. This might be shown in an arrow diagram as follows:

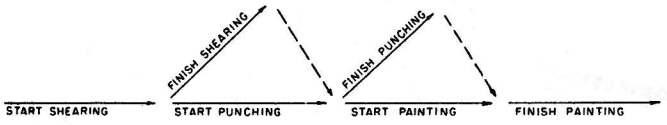


Figure 2

It is to be noted that one operation might have more than one arrow, hence the name "multiple arrow".

The junctions of arrows are described as events. Referring to our first example, the completion of the operation of opening the trunk is an event, just as the commencing of the operation of removing the jack is an event. In order to readily identify various jobs, these events are numbered. We might start numbering the tire changing operation as follows:

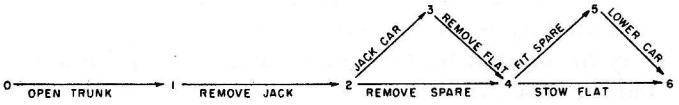


Figure 3

The activity of opening the trunk could then be described as Job 0-1, while removing the jack could be described as Job 1-2. Event No 1 could be described as "Finish Event Job 0-1" or "Start Event of Job 1-2". It is to be noted that it is possible for two different jobs to have the same start event, ie, jacking the car and removing the spare. It is also to be

noted that the assigned numbers of tail and head events are not necessarily in sequence, ie, Job 2-4 of Fig 3. It is essential that the diagram be so numbered that the number at the head of the arrow is always greater than at the tail. A simple rule is, "Never number the head of an arrow until one has been assigned to its tail." It is also necessary in numbering to ensure that no two activities bear the same identification as would be the case in the following example where there are three activities which can occur simultaneously bearing the identification Job 1-2.

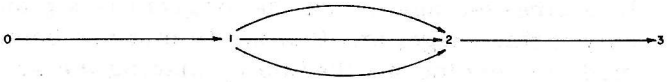


Figure 4

A situation such as this is overcome by introducing dummy arrows which are employed as follows:

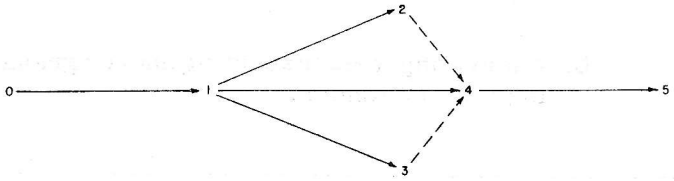


Figure 5

The dummy arrow identified by its dotted line has no time value. It may be used at either the beginning or the end of an activity arrow. In addition to serving to provide proper numbering sequence, the dummy arrow may also be used for showing interdependency of activities. For instance, in the above example, it could be stated that Job 4-5 could not commence until Jobs 1-2, 1-3 and 1-4 were completed. Another situation might be as follows:

Figure 6

Activity B follows Activity A, and Activity D follows Activity C. The dummy arrow placed as it is, however, indicates that Activity D is dependent on the completion of Activity A as well as the completion of Activity C. Activity B is dependent only on Activity A.

In developing a plan it is not too difficult to become involved with the employment of excess dummy arrows and, while they do not disturb the logic of a plan, they do make it unnecessarily complicated. The planner must always watch for situations such as depicted in Fig 7.

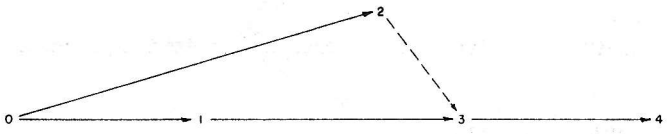


Figure 7

In this case the dummy arrow is not needed to ensure either correct numbering sequence or the dependency of Activity 3-4. This dummy arrow can be eliminated and the plan drawn as follows:

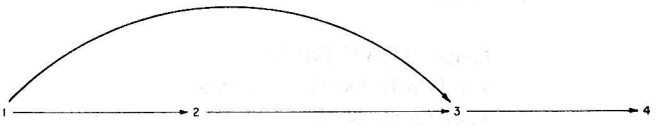


Figure 8

The reader might like to correct the numbering and eliminate the excess arrow in the plan presented in Fig 9.

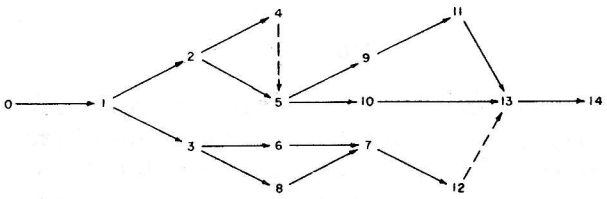


Figure 9

The fourth and last type of arrow encountered in developing a plan is the "restraint arrow". It is used to indicate an outside factor that will influence completion of a plan. A Treasury Board or QMG approval or the delivery of materials or machines are all typical examples of restraints. Restraints are represented by unconnected arrows entering the plan and terminating at the event which will be affected by the external influence. Fig 10 is an example of a portion of a plan which shows a restraint.

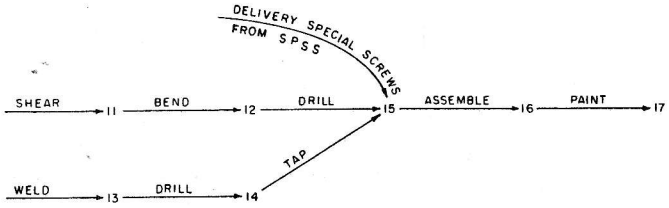


Figure 10

It will be noted that in this particular instance the assembly of two subassemblies will be dependent upon the delivery of special screws from SPSS.

This completes the presentation of information necessary to prepare an arrow diagram. It is stressed again that the diagram is a plan only at this stage, and that no attempt has been made to develop a schedule by placing the activities on a time basis. Scheduling and the determination of the critical path will be the subject of a further article. In the meantime, the reader might like to practice critical path planning by drawing and numbering arrow diagrams for some simple operations, such as

a. three men with the usual power and hand tools building engine boxes, or

b. a servicing team inspecting and/or greasing a 2 1/2 tonner.

RCEME CORPS ASSOCIATION
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Halifax, N.S.

QUEBEC COMMAND

Maj JT Brennan
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WESTERN COMMAND

Lt Col EH Goodwin, CD
1037 E 59th Avenue
Vancouver 15, B.C.

ANNEX A
TO HQ 1290-5-4 (ME 1)
DATED 29 NOV 62

RCEME CORPS ASSOCIATION COMPETITIONS

1962 WINNERS

1. Rifle Competition

   a. High Score in Canada: Engraved Plaque and Scroll

      (1) 39 Technical Squadron, Windsor, Ont.

   b. High Score in Commands: Engraved Cup and Scroll

      (1) Eastern Command - Nil
      (2) Quebec Command - Nil
      (3) Central Command - 39 Technical Squadron, Windsor, Ont.
      (4) Western Command - Nil

2. Tradesmen Competition

   a. High Percentage in Canada: Scroll

      (1) 4 Technical Regiment, Toronto, Ont.

   b. High Percentage in Commands: Scroll

      (1) Eastern Command - 21 Technical Squadron, Moncton, N.B.
      (2) Quebec Command - 25 Technical Squadron, Arvida, Que.
      (3) Central Command - 4 Technical Regiment, Toronto, Ont.
      (4) Western Command - 8 Technical Regiment, Vancouver, B.C.

3. Junior NCO Competition

   a. High Percentage in Canada: Scroll

      (1) 4 Technical Regiment, Toronto, Ont.

   b. High Percentage in Commands: Scroll

      (1) Eastern Command - 21 Technical Squadron, Moncton, N.B.
      (2) Quebec Command - 25 Technical Squadron, Arvida, Que.
      (3) Central Command - 4 Technical Regiment, Toronto, Ont.
      (4) Western Command - 8 Technical Regiment, Vancouver, B.C.

Soltau - 62

LETTER OF APPRECIATION

From 8th Canadian Hussars to 4th Field Workshop, RCEME

Canadian Army Post Office 5050
28 Sep 62

Commanding Officer
4 Fd Wksp RCEME
FORT CHAMBLY

FRG Assistance - SOLTAU 62

During the SOLTAU concentration Sep 62 the FRG attached this unit undertook 18 major repair tasks in the first few days of the exercise. The requirement for these repairs occurred during critical times in the exercise and as in the past the FRG answered the call for assistance with exceptional speed. All members of the team cheerfully worked long hours and although they were tired accomplished all jobs with a high degree of efficiency. They displayed a keen sense of urgency and in many cases they were able to complete some tasks in less time than the standard repair time.

Comments of appreciation have been expressed by Sqn Comds, Tp leaders and crews alike. It is felt however that some outward expression of appreciation should be extended to them. With this in mind the casings of two rounds fired by this regiment were made into table lamps by the tradesmen of our LAD. The cap badges of each Corps have been placed on the lamps and they have been suitably engraved to express appreciation for the support received from all FRG teams over the past three years.

It is requested that these lamps be presented to the current representatives of the FRG at some suitable occasion after which it is suggested they repose in the men's lounge of your unit.

(J W QUINN)
Lieutenant-Colonel
Commanding Officer

AJM/pt

LETTER OF REPLY

From 4th Field Workshop, RCEME to 8th Canadian Hussars

4 Fd Wksp RCEME
CAPO 5050
KORBECKE Mil 545

Oct 62

Commanding Officer
8 CH
Fort Beausejour

FRG ASSISTANCE - SOLTAU 62

Your most thoughtful and welcome gesture in presenting the workshop FRG with a pair of engraved lamps made from the casings of regimentally-fired rounds is deeply appreciated, not only by FRG members, but by all workshop personnel.

Such tokens are rare in workshop operations and thus all the more highly prized. I am sure that this will do much to increase the already close link between the tank repair teams of the workshop and the tank crews of the Regiment.

The lamps were presented to-day, on your behalf, to members of the FRG at a unit muster parade, and will be permanently maintained in the men's lounge.

Please convey my sincere thanks to the Squadron Commanders, Troop leaders and crews whose appreciation has been so tangibly expressed.

(H W Chapman)
Major
Commanding Officer

PRESENTED
TO
4 FD WKSP
FRG TEAMS
IN
APPRECIATION
OF
MAJOR REPAIR SUPPORT
8TH CANADIAN HUSSARS
GERMANY 59-62

L to R: Major HW Chapman, CO 4 Fd Wksp, presenting lamps to S sgt BJ Hynes and S sgt AL Harlow
Army Photos

Front Row l to r: Cpl FGA Belsham, Cfn RL Gates, Cfn GW Toop, Cpl S Cook, Cfn DP Brightman.
Second Row: S sgt AL Harlow, Cfn JH Seguin, L Cpl RN Dowe, Cfn AA Gordon, Cpl DL Cox, Cfn WH Riddell, L Cpl RJ Logan, Cfn WE Byers, Cfn PE Perry, Cfn DM Warf, S sgt BJ Hynes.

RCEME in the Battle Group

AUTUMN EXERCISES 1962 - EUROPE

By Captain LJE Byer

BACKGROUND

During the autumn of 1962, units of the 4th Canadian Infantry Brigade Group (4 CIBG) stationed in Germany took part in two consecutive one-week exercises. Both exercises were aimed at practising 4 CIBG in all the aspects of defensive operations, including the operation of a strong covering force forward of a major river obstacle.

The first exercise (Ex SILVER DOLLAR) ran from 1 Oct to 5 Oct. It was a one-sided exercise with a controlled enemy designed to practise 4 CIBG in the conduct of the defence. The second exercise (Ex CANADA CUP) ran from 8 Oct to 12 Oct. It was a 4 (BR) Division two-sided exercise designed to practise commanders and staffs in the handling of troops in both offensive and defensive operations under conditions of nuclear and non-nuclear warfare. For this exercise 4 CIBG defended against an attacking force composed of 4 Guards Brigade Group reinforced by an American Armoured Rifle Battalion.

For these exercises 4 CIBG was deployed in four battle groups with the following units as the predominant arm:

8 Canadian Hussars
1 Canadian Guards
1 Queen's Own Rifles of Canada
2 Royal Highlanders of Canada

This defensive battle saw a strong brigade covering force enforcing delay on the enemy for some 10-12 miles on the far side of the obstacle. Subsequently the main defensive battle was fought on the obstacle by infantry battle groups with the 8 CH Group in mobile reserve.

AQ PLANNING

Approximately two weeks prior to the start of these exercises several decisions were made with regard to the AQ planning aspects of these exercises. The more important decisions that affected the RCEME planning for these exercises are listed below:

a. No unit 'B' Echelons would be formed. All 'B' Echelon vehicles and personnel other than those employed as unit rear parties would be located with unit 'A' Echelons.

b. Normal maintenance would be based on the ADM SITREP and the Delivery Point (DP) system. Unit 'A' Echelon representatives would submit an ADM SITREP daily to REAR HQ 4 CIBG (REAR), showing their requirements for the next 24 hour period. One consolidated ADM SITREP would be sent by the predominant arm of a battle group for all units and sub-units within that battle group. The commodities would be delivered to a DP which would be established each night. 'A' Echelon representatives from battle groups and other units would pick up their commodities at this DP each night.

c. Essential traffic only would be allowed to move during daylight hours and then only on the authority of REAR.

d. RCEME resources within 4 CIBG would be grouped so that maximum repair could be done in-situ and other repairs could be completed as far forward as possible.

e. Only real vehicle casualties would be played. The order of priority for repair of vehicles would be as follows:

Fighting vehicles and equipment
Special signal vehicles
Load carriers

f. Helicopters would be available during Ex CANADA CUP for any priority AQ tasks.

The author, who was A/BEME during this period was asked to review the repair organization as it exists in 4 CIBG and to present a RCEME plan. The following are the author's opinions on what he feels are the basic elements required for a battle group RCEME repair organization. These opinions, although not completely agreed with by all the RCEME officers in 4 CIBG, were used as the basis for the RCEME repair plan for the above-mentioned exercises.

UNIT AND LAD REPAIRS

Let us first discuss the unit and LAD repair organization as it applies to a typical battle group. The organization of any one battle group will depend, among other things, upon the tactical situation at any one period in the battle, and upon the Superior Commander's plan for that battle group. However, it is fairly safe to assume that any battle group will have in it some elements of infantry, armour and artillery. A typical battle group is one where the infantry battalion is the predominant arm. In all probability this battalion would have its affiliated gun battery and part or all of its affiliated tank squadron with it. The battle group would also have other small detachments with it, ie, Signals and Engineers. Each of these elements would have its normal complement of mechanics.

It was felt that the highest echelon of repair feasible for any arm is that for an LAD. Some means had to be devised to permit all elements in the battle group to undertake LAD repairs, ie, for all wheeled and tracked vehicles and weapons. In addition, unless there were some form of centralized control of all the repair elements within a battle group, there would be duplication of effort, such as:

a. Extensive holdings of fast moving unit and LAD spares scattered throughout the battle group with no system by which one sub-unit could utilize spares held by another sub-unit in an emergency (VOR).

b. Spare parts ordering, receiving, holding and issuing would be done by many individuals within the battle group.

Other factors needed consideration. There was a need to bring sub-unit repair elements within a battle group under some central battle group repair organization for LAD support for problems specific to repairs, ie, parts ordering, specialist repair services offered by electricians and welders, and recovery facilities. This battle group repair organization should also be capable of sending out Mobile Repair Teams (MRT) to complete up to an LAD echelon of repair as far forward in the battle group as the tactical situation will permit.

A basic plan was drawn up assigning the existing LADs in 4 CIBG to the predominant arm forming the nucleus of a battle group. These LADs formed a Battle Group LAD HQ. The LADs were assigned to units as follows:

a. 1 QOR of C Battle Group - 1 QOR of C LAD (Note: In 4 CIBG, 1 QOR of C have been augmented so that an ad hoc LAD services this unit).

b. 2 RHC Battle Group - 3 RCHA LAD (less battery and RHQ sections).

c. 1 CDN GDS Battle Group - HQ 4 CIBG LAD (less detached personnel).

d. 8 CH Battle Group - 8 CH LAD (less squadron sections).

The Battle Group LAD HQ had the following functions:

a. Provide a means of controlling centrally the RCEME repair effort within the battle group.

b. Hold a complete set of unit and LAD scales for 'B' vehicles, guns and tanks.

c. Order, receive, hold, account for and issue all spare parts for all the RCEME repair elements within the battle group.

Many problems were then encountered with this plan and had to be solved before the plan could be put into effect. Some of the more important problems are listed below:

a. There were not enough sets of scales in 4 CIBG to give each of the four battle groups a complete set of unit and LAD scales for 'B' vehicles, guns and tanks.

b. The 3 RCHA LAD is the main user and only accounting unit at the unit and LAD level for gun spares. Because of peace time accounting procedures it was highly desirable that they maintain this role. How then could it be arranged so that all Battle Group LAD HQ could order and receive gun spares and still have 3 RCHA LAD control the accounting for these spares?

c. The problem as mentioned in paragraph b above was found to be true for tank spares also as the 8 CH LAD is the main user and only accounting unit at the unit and LAD level for tank spares.

d. How could replenishment and ordering of parts for the battle group and other units be accomplished, and the parts be delivered to the ordering units when there were no 'B' Echelons formed in the BAA to do this task?

e. How could emergency spare parts for vehicles off the road be ordered and received without an unacceptable time delay?

After consultation with the CO of 8 CH LAD, the A/CO of 3 RCHA LAD, the Brigade Signals Officer, the Brigade Ordnance Officer and most units' Second in Command, the problems were solved and the plan was put into effect.

FIELD REPAIRS

It was decided that one Equipment Collecting Point (ECP) would be established centrally for the brigade. The ECP would be manned by 4 Field Workshop RCEME personnel so that wheeled vehicle faults could be diagnosed, spare part requirements established and decisions made as to whether the work should be done in-situ at the ECP or be backloaded to the workshop site in the BAA.

After consultation with the CO 4 Field Workshop the following decisions were made with regard to doing field repair to the various types of equipment in the brigade as far forward as possible.

It was decided to give the Radio Section of 4 Field Workshop an imprest account of spares and to locate the section at REAR. Also at REAR was a repair detachment from 4 Signals Squadron. Minor repairs in the forward area were to be done by the 4 Signal Squadron Repair and Maintenance Team at MAIN HQ 4 CIBG (MAIN). Also 4 Signal Squadron would be responsible for backloading Signals-operated radios to the RCEME Radio Section at REAR. Unit representatives from 'A' Echelons would take their N/S equipment to the DP each night. A representative of the RCEME Radio Section would meet them at the DP and accept their N/S equipment. The equipment would be repaired during the next day (provided parts were available) and returned to the unit 'A' Echelon representative the next night - a down time of about 24 hours. This arrangement was made on the supposition that the distances involved between the BAA and the user units would be such that the down time for radio repairs would not be acceptable if the RCEME Radio Section remained in the BAA. This system worked well. However, after the first exercise, it was decided to move the Radio Section back to the workshop's location in the BAA. This decision was based on the following factors:

a. REAR was too vulnerable a target and the entire field repair element for radios was located there. It was felt that this was too risky and that this highly specialized section probably would be safer in the BAA.

b. Noises created by the generators of the Radio Section were not acceptable at REAR as they could be heard for miles and pinpointed this location for the enemy.

c. There was inadequate communications between the Radio Section at REAR and its source of spare parts supply - 4 Field Workshop SPSS in the BAA.

The final arrangement had units continuing to take their N/S equipment to the DP and being met there by a representative of the Receipts and Issue Section of 4 Field Workshop RCEME who accepted the N/S equipment. The N/S equipment was repaired during the next day and returned that night. The down time in some cases was better than the first plan as the Radio Section was handy to its source of parts.

Tank repair teams (FRG) would be sited centrally to the four battle group areas and would be deployed to casualty sites as directed by BEME.

The principle of carrying out repair as far forward as possible had to be balanced against the resources of the field workshop to provide wheeled vehicle MRTs. The compromise agreed upon was that as many wheeled vehicles as possible requiring field repair would be repaired at the ECP. Sufficient transport was provided to carry the spare parts and personnel and to provide one mobile team to handle in-situ repair of specialist wheeled vehicles. All other wheeled vehicles would be repaired either in the ECP or in the workshop in the BAA. This wheeled vehicle element was placed under command the FRG.

Tank main armament and field guns would be backloaded to the BAA for field repairs. Field repairs to these weapons are infrequent, and when they do occur they are generally of a major nature requiring extensive workshop facilities.

All other equipment, ie, small arms, chore horses and instruments would be backloaded to the BAA through the DP as for radios.

RECOVERY AND BACKLOADING

Units were made responsible for recovery of vehicles to unit locations and backloading them to the ECP. This procedure was possible because each battle group had an M62 recovery vehicle. The BEME was assigned one of the workshop vehicles for handling miscellaneous units. In addition, units were responsible for backloading other equipment requiring field repair to the DP.

The workshop was responsible for backloading vehicles from the ECP to the workshop located in the BAA. In addition, the workshop accepted N/S equipment at the DP and backloaded it to the workshop. Workshop recovery vehicles were used as follows:

1 - assigned to BEME
1 - assigned to 1 QOR of C LAD
1 - used as mobile crane at ECP
3 - used with FRG tracked repair teams
1 - used by the workshop Vehicle Platoon
1 - used by workshop for recovery in BAA and for backloading from ECP.

COMMUNICATIONS

A few words should be said about the communications available for RCEME use between units, the ECP and 4 Field Workshop RCEME. Battle Group 'A' Echelons were on the Brigade Adm Net to REAR, as was the ECP. REAR had a one to one link with 1 Transport Company in the BAA. The 4 OFP and 4 Field Workshop RCEME kept DRs at 1 Transport Company so that any messages sent from REAR through 1 Transport Company for these units could be delivered to them. In addition, there was a rover set on the Brigade Adm Net at REAR available for BEME on an 'as required' basis.

A 'Request for Spare Parts' code was made up for all the major equipments in the brigade. Spare parts could thus be ordered during the day by user units by radio in a very few words, and could be delivered that night to the unit 'A' Echelon representative at the DP. It should be pointed out that such a request had to be sent to REAR who then relayed the message to 1 Transport Company. The DR at 1 Transport Company then took the message to 4 OFP for action.

A 'Request for EME Services' was made up for units to use when requesting additional RCEME support from BEME.

A 'Tank TASKREP' was prepared by the FRG with copies going to BEME at REAR and the SC(Q) at MAIN. In this way the 'G' Staff and BEME were kept informed as to the progress of field repair on the armoured vehicles within the brigade.

SPARE PARTS CONTROL AND REPLENISHMENT

The detached LAD sections from the 8 CH LAD and the 3 RCHA LAD used blocks of internal shop job cards obtained from their parent LAD to account for tank and gun spares. 4 OFP had a representative at the DP each night to accept replenishment demands from unit 'A' Echelon representatives. The requisitioned spares were brought up the following night (if available) to the DP for issue to the units. The 8 CH LAD and 3 RCHA LAD storemen with their stock of tank and gun spares rendezvoused at the DP with the battle group and other units 'A' Echelon representatives each night. Thus the detached sections were able to draw tank and gun spares directly from their own LAD storemen. All replenishment of tank and gun spares through the OFP was done by the 8 CH LAD and 3 RCHA LAD storemen only. Units near the BAA replenished their spares directly on the OFP.

REPAIR PLAN IN PRACTICE

The RCEME plan provided for:

a. Flexibility - to keep pace with rapid changes in tactical groupings.

b. Economy of Effect - to reduce duplication by various arms repair elements within a battle group and to make maximum use of specialized tradesmen, tools and equipment and spare parts.

c. Maximum in-situ and Forward Repair - by augmenting the infantry battalions repair capability so that an LAD line of repair could be undertaken by all units and sub-units within each battle group.

Speaking generally, all units were satisfied with the RCEME services during the exercises. The concepts employed in the AQ planning and the RCEME plan were new to all units of 4 CIBG. All units adapted themselves extremely well to these new concepts. From time to time units and detached sub-units could establish communication directly and hence the parent LAD could pass parts or provide assistance more rapidly than by going through the Battle Group LAD HQ. Perhaps the more speedy repair effected justified the procedure but it did at times leave the Battle Group LAD HQ confused.

LESSONS FROM THE EXERCISES

It must be pointed out here that the concepts and resultant RCEME repair organization used during these Autumn exercises never were tested completely to see if in fact they would work satisfactorily over an extended period of time. Units, as usual during short exercises, made every effort to keep their vehicles in the unit until the exercise ended. The amount of repair undertaken at all levels during the exercises was small. However, even during this short period of exercising, certain lessons were driven home as far as the existing RCEME repair organization in a brigade group is concerned. These are as follows:

All unit RCEME repair organizations are built with a certain degree of flexibility inherent in them, in that they can be decentralized into repair sections to accompany detached sections of their parent unit into the field. The flexibility falls short of that required when units and sub-units are deployed in battle group formations. The only exceptions to this are such highly mobile units as the Recce Squadron, the Engineer Squadron and the Missile Battery, all of which are organized at present for deployment by sub-sections over large areas. The repair organization must be designed with an inherent flexibility capable of coping with the frequent changes made when the battle group technique is employed. This means that:

a. All RCEME officers within the brigade must not only have considerable knowledge of the equipment that they normally service but must have considerable knowledge of all the equipment used in the brigade, ie, vehicles, tanks, guns, etc.

b. Each battle group formed must have a central repair headquarters with the following:

It must hold a complete set of unit and LAD scales for all equipments found within that battle group.

It must be capable of holding some unit and LAD spare parts for all the equipments likely to be found within that battle group.

The HQ itself must remain fixed with its specialist tools, tradesmen and recovery equipment to give unit and LAD support to all attached sub-unit repair elements within that battle group.

c. It is foreseen that detached RCEME repair elements will move from battle group to battle group with their parent sub-units. These mechanics will take with them only their tool boxes and perhaps a few fast moving spare parts, and will rely on the central RCEME repair headquarters for all other support.

d. It is essential that infantry battalions be augmented so that they can undertake an LAD echelon of repair. In addition, battalions should have a recovery vehicle organic to their repair elements.

It was found that the existing communications available to RCEME in the Brigade group today is far from satisfactory. It is desirable in many cases and essential in others that repair be effected in-situ or as far forward as possible. To achieve this it is desirable to create a repair organization which is decentralized. However, to retain flexibility so that maximum use is made of all tradesmen and specialized equipment, there is a need for centralized control. In addition, a rapid means of ordering spare parts is essential if the forward repair elements are to be effective. Thus there is a need for a radio communication net for handling repair matters. The Command and Administrative radio nets are fully occupied in conducting the battle. Mundane matters such as ordering spare parts or deploying repair teams clutter up these radio nets and experience shows that repair matters often get low priority. If there is a need for repair to be done well forward, then there is a need for radio communications devoted exclusively to repair and recovery.

It was found that there is a requirement for mobile repair teams capable of doing field repairs in-situ to specialized wheeled vehicles, ie, Command Post and certain other radio vehicles. If this requirement is to be satisfied, additional transport in the workshop is needed.

There is a need for a small crane to be fitted to FRG vehicles so that the M62 recovery vehicle need not be tied up on repair as opposed to recovery and backloading.

This interesting article points out problems which have been the subject of considerable study. Conclusions reached in these studies provided the following results:

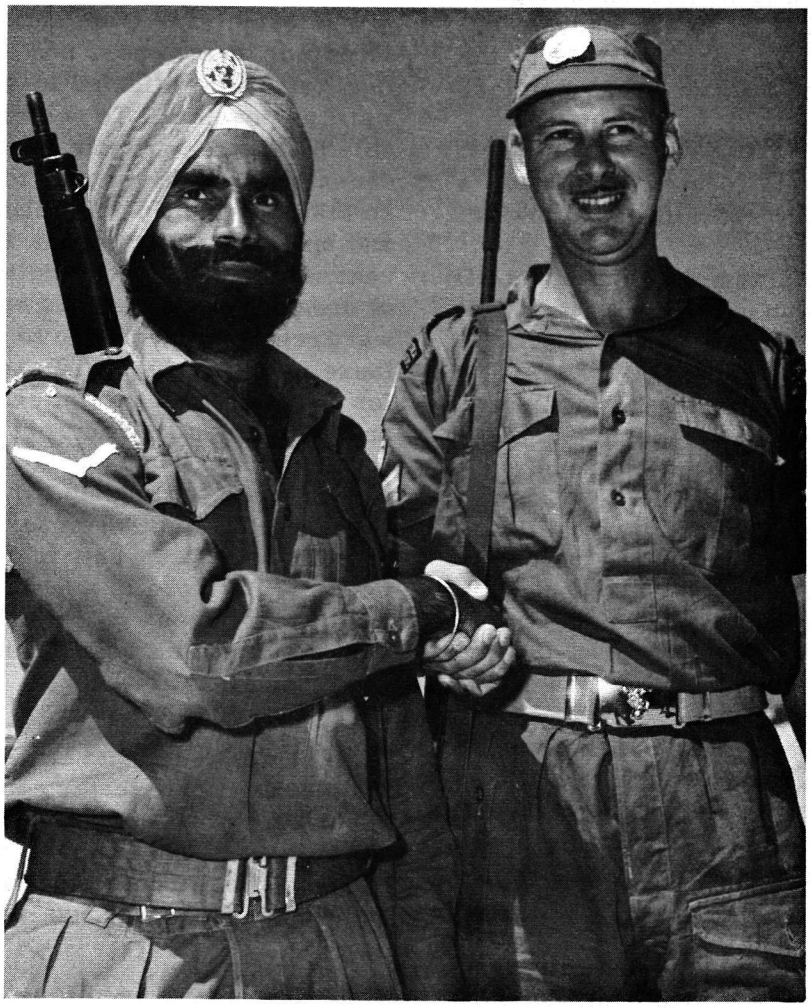
- The new field workshop establishment contains a forward repair platoon capable of producing mobile repair teams – manned and equipped to provide service on demand. When a casualty is reported, a mobile repair team will draw the assembly necessary to complete the repair, proceed to the casualty and carry out the task.

- Mobile repair teams are provided with eight Crane Truck Mounted 3/4 ton vehicles (six with the wheeled teams and two with tracked teams). These will reduce the need for Trucks Recovery 5 ton in the forward area.

- The reorganization of personnel from LADs will provide tradesmen organic to units and will give all Arms units the Permissive Repair Schedule (PRS) previously reserved for LADs.

- The addition of a separate radio communication link for repair and recovery has been the subject of detailed studies and it has been proven that the administrative net can adequately handle repair and recovery traffic.

RCEME HAS BEST MARKSMAN



Staff Sergeant BG Walker, 56 Infantry Workshop was awarded a trophy as the best marksman in the 5000-man, seven-nation UNEF force.

Staff Sergeant Walker edged out Lance Corporal H Singh of India in a tense sudden death match after they both scored 74 out of a possible 75 points: ten consecutive bulls from 270 yards, followed by 24 out of 25 points each in snap shooting from 180 yards. In the tie-breaking shoot both scored bulls on their first shot. On the second shot Walker scored a bull and Singh just missed it.

Both fired weapons now in use in their respective armies – the Canadian used the FN (C1) rifle and the Indian the Lee Enfield service rifle.

In team practices Sikh soldiers of India swept all events; final team standings were: India 660, Yugoslavia 599, Sweden 559 and Canada 554, out of a possible 750 points.

A WONDERFUL UNAUTHORIZED PIPE BAND

By Capt RT Haworth RCEME(M)

In October 1958, a small group of experienced Pipers and Drummers approached the Commanding Officer with a view to forming a Unit Pipe Band.

In view of the possible morale boosting and recruiting value of such a band, the CO agreed to attempt to obtain permission for an authorized Unit Pipe Band.

The eight men originating the idea joined the unit and the wheels were set in motion to obtain such permission. However, this was refused in spite of the fact that authorization was granted for a 20-man bugle band (should certain requirements be met) (Appendix B to COA 1065-3/1 (A) dated 2 Jun 57).

The unauthorized band continued to practice and by May 1959 had increased in number to 14 members. The uniform worn was battle-dress, the instruments the players' personal property with the exception of 4 drums purchased with non-public funds. At this time, further application was made to authorize a Unit Pipe Band. This was again met by refusal.

Nevertheless, hope had not died, and the band continued to practice and parade for unit functions with what equipment was available.

In May 1960, an opportunity arose to purchase the basic requirements with respect to uniforms from a defunct band in Detroit, Michigan. This consisted of MacFarlane Tartan Kilts, Sporrans, hats, spats, hose tops, flashes, etc. As no unit money was available, all the band members (and the Band Officer) decided to each buy a share and purchase this $2,500 bargain for $600. As Militia pay night was imminent, funds were no problem.

However, this meant that with only half the requirements for regulation Army dress, they were still unable to parade as 30 Tech Sqn Pipe Band, so the name Clan MacFarlane Pipe Band was adopted. The main prerequisite for membership was to be on strength of 30 Tech Sqn RCEME(M).

Under the direction of Pipe Major JV Greig (ex Sgt/Piper Black Watch and Edinburgh City Police Pipe Band), the pipe section were, in some cases, re-taught the basic fundamentals of piping.

Drum Major J Kirkwood (ex World Champion, Shots and Dykehead Pipe Band and Highland Brigade Band at Edinburgh Castle) built up one of the finest drum corps in this part of the world.

Street parades were played to raise funds for equipment but yet the main goal seemed to be Highland Games Competitions.

Under the Clan MacFarlane Pipe Band name, the year 1961 produced encouraging results:

Highland Games	Class B March, Strathspey and Reel	Open Slow March	Open Drum Corps
Grimsby, Ont	First	Third	First
St. Catharines	First	--	First
Embro	Tie First	--	No Contest
Fergus	Third	Nil	No Contest
Syracuse, NY	Second	No Contest	No Contest

Prize monies were used to purchase more uniforms and equipment.

In addition, unit parades were performed as requested by the Unit CO, wearing a combination of the Kilts and issue battledress. The band parade state by this time numbered 18 all ranks.

After a winters' hard practice, 1962 produced the desired results.

Highland Games	Class B March, Strathspey and Reel	Open Slow March	Open Drum Corps
Grimsby	First	Tie Third	First
St. Catharines	First	Nil	First
Embro	First	Third	No Contest
Fergus	First	Fourth	No Contest
Syracuse, NY	First	No Contest	No Contest
Maxville (North American Championship)	First	First	Second

The surprise of the year was, of course, winning the Open Slow March contest at Maxville, defeating such bands as Canadian Guards, 48th Highlanders, Argyle and Sutherland Highlanders, City of Toronto and Worcester, Mass. (Class A Champions).

The band still parades and practices with the Unit and proves to be a welcome addition for any unit parades. Unit morale has certainly increased as has the Men's Canteen Fund, piping being a thirsty pastime.

Next year as a Class A Band, further successes are even now being diligently practiced for, under the eagle eyes of the proven competent Pipe Major and Drum Major.

Authorization still seems to be beyond the horizon, but nevertheless, at no public expense, this unit has one of the best pipe bands around, and has proved it!

TECHNIC TEASERS

Compiled by Capt P Nicholson

RCEME and ingenuity go hand in hand. Do you qualify? Check out your skill on these mental teasers.

1 Rich Mr Vanderford buys a bottle of very old French brandy in a liquor store. The price is $45. When the store owner hands him the wrapped bottle, he asks Mr Vanderford to do him a favor. He would like to have the old bottle back to put on display in his window, and he would be willing to pay for the empty bottle. "How much?" asks Mr Vanderford. "Well," the store owner answers, "the full bottle costs $45 and the brandy costs $40 more than the empty bottle. Therefore, the empty bottle is ..." "Five dollars, "interrupts Mr Vanderford, who, having made a lot of money, thinks he knows his figures better than anyone else. "Sorry, sir, but you can't figure," says the liquor dealer and he was right. Why?

2 In a Tennessee mountain community the miller retains as his fee one-tenth of the corn the mountaineer delivers for grinding. How much corn must a farmer deliver to get back 100 pounds of corn meal, providing there is no loss?

3 In how many ways can you express 1,000 as the sum of two or more consecutive numbers?

Reducing fractions may seem elementary but don't skip this one.

4 If we delete the numeral occurring in both the numerator and denominator of the fraction 26/25 we don't change its value because 26/25 = 2/5. What other fractions consisting of two-digit figures in the numerator and denominator can be similarly reduced?

You say you're having trouble and need a morale booster. Try this one.

5 This is supposed to have happened in London during the war. The sirens screamed; all lights go out. A man jumps out of bed and starts running for the air raid shelter. Then he realizes that it will be cold in the basement and that he had better get a pair of socks. He turns back and opens the drawer which holds his stockings. Only then is he aware that all the lights are out, which makes it impossible for him to see what he grabs in the drawer. He is a man of self-respect and order and would hate to be seen with two socks of different colors. He knows that the drawer contains nothing but black and brown socks which, unfortunately, he cannot distinguish in the darkness. Now, what is the minimum number of socks the man must grab to be sure he will find a matched pair among them when he reaches the shelter?

(continued on page 28)

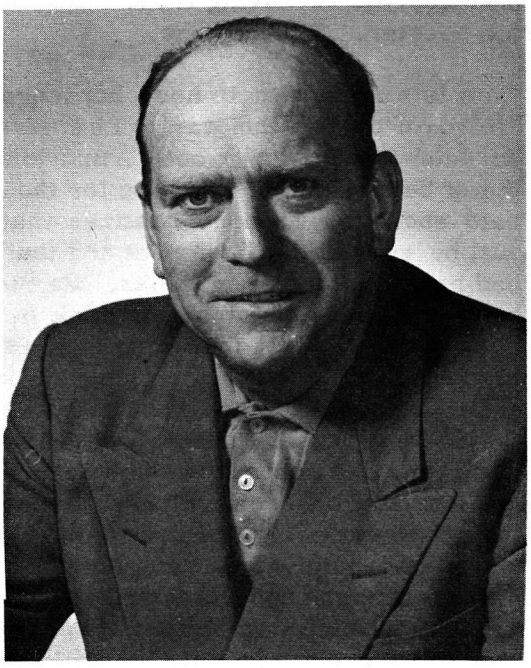
Back row (l to r): Piper Simpson, Drummer Fair, Drummer Kidd, Piper Gooder, Drummer Hills, Drummer Agnew, Drummer Cochrane
Middle row: Piper Cameron, Piper Hilbert, Cpl MacNeil, Piper Fergusson, A. N. Other, Piper Gillies, Piper Munro, Piper Reid, Piper Hilbert
Front row: Pipe/Sgt Semple, Drum/Sgt Jim Kirkwood, Drum/Major John Kirkwood, Pipe/Major JV Greig

-McGlenister and Brisson photo

IN RETROSPECT

The Award of the Military Medal
to
C12037 Sergeant Robert Louis Hurry
11 Canadian Infantry Brigade Workshop
Royal Canadian Electrical and Mechanical Engineers

By Lt Col RH Hodgson CD



Mr RL Hurry MM
Rental Center Regd
Ottawa, Ont.

A recovery post under the command of Sergeant Bob Hurry of the 11th Canadian Infantry Brigade Workshop RCEME was located at the Hongi Bridge on the Orsogna Front in Italy. This small group consisted of D128997 Cfn W Boyce, G19239 Cfn JC Thompson and SB19024 L/Cpl Fred T Cross who was Mentioned In Despatches for this action (later he became WO2 at 204 Base Workshop, Hagersville, Ont.)

On the morning of the 8th of February 1944 Sergeant Hurry received word that a scout car carrying secret wireless equipment used for communicating with advance troops had become immobilized by mud in a minefield about two miles north west of Arielli and about 500 yards north of the Orsogna lateral road.

Hurry was warned by an officer from The Perth Regiment of the dangers from mines and heavy mortar shelling for the site was under direct enemy observation. Without hesitation Hurry and two of his assistants set out to recover the scout car. In spite of the intense mortaring and many narrow escapes from injury, Hurry and his men were successful in recovering the vehicle with its secret equipment.

His citation adds "Two days later Sergeant Hurry set out again with the same crew to recover three vehicles of The Perth Regiment in the vicinity of Poggiofiorito. It was essential that the unit receive these vehicles without delay. Although the roads were completely washed out by rain and the resultant mud was almost impassible; after more than six hours of unceasing labour, Hurry and his men recovered the vehicles by building a road on

which the recovery vehicles could work. During this time there was imminent danger of enemy mortar fire since that particular area had been mortared heavily during the preceding days".

His citation continues: "This non-commissioned officer showed great initiative, coolness and resourcefulness in the face of danger. His inspired leadership and determination infused those with him with an indomitable spirit that would not accept defeat. His high conception of duty was responsible for getting forward to The Perth Regiment certain essential vehicles at a critical time".

It was not generally known that Hurry made a specialty of recovering vehicles from minefields. His success wasn't appreciated until an 8th Army Inspector visited 11 CIB Workshop in the process of combing out unauthorized vehicles to replace the jeeps which were generally in short supply, and to search for vehicles for the Indian Army who had suffered high losses in mules. Then it was revealed that Sergeant Hurry personally had added 10 jeeps and 1 panel truck recovered from minefields to 11 CIB's unauthorized holdings of vehicles.

Are You A Good Listener ?

Maj R W Libbey CD

"If any man have ears to hear, let him hear. And He said unto them, take heed what ye hear: with what measure ye mete, it shall be measured to you; and unto you that hear shall now be given."

(Mark 4: 23-24)

Test your listening ability by answering the following questions:

1. How many words will a person hear in a 10-minute conversation?

300 500 600 900 1200

2. How fast does one think during normal conversation in words per minute?

100 300 700 800 1000

3. Immediately after the average person has listened to someone talk he remembers only about 20% 35% 50% 65% 75% of what he has heard. Select the percentage you believe to be correct.

4. When a message is passed down through five levels of management, only 67% is understood at the first level, 56% is understood at the second level, 40% at the third and 30% at the fourth. How much does the worker on the fifth level understand?

10% 15% 20% 25%

5. The average person spends 75% of his waking day in verbal communication. What percentage of this time is spent in listening?

30% 45% 55% 60%

6. Does efficient listening require physical energy?

Turn the page for answers (but don't cheat)

LETTERS TO THE BULLETIN

Major Tylden, ED, of Eastbury, Newbury, Berks, England, is writing a book "Saddlery and Remounts" covering all Commonwealth countries for the Army Museum's Ogilby Trust, War Office, London.

In his letter he wrote "... at the moment I am working on pack saddles used in the last war. The Director of Army and Remount Services at the War Office has written as follows on the Sicily landing; 'the Canadians had their own pack saddles, the only unit without improvised saddlery.'"

Any reader who has knowledge relating to military, NWMP or RCMP saddlery and who would be interested in making their knowledge available to Major Tylden is invited to write to The Editor of The Bulletin for a copy of Major Tylden's letter.

Well-Are You?

1. Between 600 and 900. So What?

Many of these words have different meanings to you than they do to the speaker. This automatically causes misunderstanding and can only be corrected by increasing one's vocabulary and by listening to the way the words are used. One should pay attention to the speaker's gestures, tone of voice and facial expression to see if they add meaning to the spoken words.

2. From 300 to 800 words per minute. So What?

Since you are thinking much faster than the words are spoken, you are usually away ahead of the speaker. Consequently you may wander off and think about other subjects not related to the speaker's message. In other words you are not concentrating on the speaker's message. More active participation in the conversation will help to overcome this.

3. Extensive tests have shown that the average person remembers only 50% of what he hears and as time passes he forgets more. In two months for example he remembers only 25%. One way to improve your retentive power is to summarize the major points to which you listened immediately on conclusion of the conversation and once again not more than 12 hours later. Try it!

4. The worker understands about 20%. This great loss of understanding is due primarily to each person's poor listening habits. To overcome this, or even improve it, we must strive to better understand the attributes, opinions, ideas and suggestions of the people at the bottom and listen carefully to them.

5. 45%. It has been proven that unless the average person has had some training in listening techniques, his listening efficiency is only 25%. Imagine the overall inefficiency this causes!

6. Yes. Efficiency listening is characterized by a quick action of the heart, a fast circulation of the blood and a small rise in body temperature. This consumes energy. Therefore to listen well, you must expend some energy.

If these questions have aroused your curiosity about your own listening ability and you would like to find out more, I suggest you read "Are You Listening?" by Dr. Ralph G. Nichols, from which this quiz was prepared.

Training Notes

By Capt FF Doherty CD

VEHICLE MECHANICS

The new trade specifications for Vehicle Mechanic Tracked Groups 1, 2 and 3A, Vehicle Mechanic Wheeled Groups 1, 2 and 3A and Master Vehicle Technician Group 4 were approved in principle by the Army Trades Committee on 17 Sep 62. A rewrite was necessary as some detail and reference material was lacking at that time. The final proposed specifications are now ready for resubmission to Army Trades Committee and it is hoped they will receive final approval in the near future.

Approval was granted by DMT to commence group 1 training based on these new specifications. Two separate courses: RCEME 123 Vehicle Mechanic Tracked Group 1 and RCEME 124 Vehicle Mechanic Wheeled Group 1 are now required. The first serial of RCEME 124 Vehicle Mechanic Wheeled started on 7 Jan 63. All subsequent group 1 courses will be based on these new specifications. With commencement of the first course, a single qualification only now will be granted: qualified as either Vehicle Mechanic Wheeled Group 1 or Vehicle Mechanic Tracked Group 1.

New Group 3 and Group 4 courses based on the new training requirements are not scheduled for the remainder of the present course year. It is expected that these will commence in Sep 63. Included will be a course for Vehicle Mechanic Wheeled Group 3A, as the new specification requires qualification by formal course and not a trade test as is now the case.

ELECTRICAL MECHANICS

New trade specifications for Electrical Mechanic Groups 1, 2 and 3A and Master Electrical Technician Group 4 have been written and will also be ready for submission for Army Trades Committee approval within the next few weeks. The new specification requires courses for both group 1 and group 3 qualification. The first group 1 course based on these new specifications is now in progress. The length of this course has been shortened to 16 weeks from the former 25 weeks.

The new group 1 course no longer includes Centurion gun control and stabilizer equipment. This equipment will now be taught at the group 3 level together with Navaid and Infra-red equipment. The new group 3 course is being scheduled for the training year commencing Sep 63.

MASTER TECHNICIANS

The rank prerequisite for group 4 courses was lowered last year from "being a qualified senior NCO" to "being a substantive corporal". The new group 4 specifications now being processed ie, Master Vehicle Technician and Master Electrical Technician, show no rank prerequisites. The "common to artificer" training is no longer a trade requirement but is now or will be included in NCO and Engineering Technician courses. When the remaining group 4 specifications are written, the same principle will apply.

RADIO, RADAR AND FCS TECHNICIANS

D Org has commenced a study of these trades before preparing new specifications. It is hoped that they will be produced and approved by the end of 1963. New equipments, including Avionics, now being introduced into or already in service are being considered for inclusion in the new specifications.

AIRCRAFT TRADES

The combination of Airplane Technician and Helicopter Technician into a single trade tentatively called Aircraft Technician has been approved in principle and rough draft specifications have been prepared. A more detailed study of the overall requirements must still be

made. Work is now in progress in DEME (PTO) on this phase and if all goes as planned, new specifications will be prepared for approval by 1 Jun 63.

Similarly, draft specifications for an Aircraft Instrument and Electrical Technician Groups 1, 2 and 3, and Master Instrument and Electrical Technician Group 4 have been prepared. Again it is hoped to have these ready for submission to ATC by 1 Jun 63.

There are no plans at the present time to change the present method of training for Radio Technicians employed on Avionic equipment. A separate trade for this group of tradesmen will not be written at the present time.

New Body Repairman specifications have been written but submission for approval has been delayed because of the aircraft requirement. Present plans call for a separate specification for an Airframe Repairman progressing from Body Repairman Group 3. If all goes well, this will be written within the next few months.

TRADE SYMPOSIUM

A Trade Symposium will be held in the near future to discuss and decide on an overall RCEME trade structure and policy. The responsibility for the repair and maintenance of new equipments to be introduced into service will be included. Particular consideration will be given to those equipments which may be considered borderline or which require both mechanical and electrical skills and knowledge to repair.

MILITIA RADIAC MECHANIC INSTRUCTORS COURSE

The first course for potential Militia Radiac Mechanics was run at RCEME School in Jul 62. Another similar course is again being planned to be conducted in late Jun or early Jul 63. Militia commanders should now plan for and request vacancies on this course through their Command EME. Candidates for this course must understand and speak English, and should have some electrical background training or experience. CA(M) officers should not be candidates on this course as the trade specification and the course is written for ORs.

PROPOSED NEW COURSES

Following is a list of new courses being planned by DEME but not yet firm. Whether approval will be given for some of the courses now planned for the 1963-64 training year will depend on when RCEME School receives the main equipment and its associated test equipment.

1. Direct Entry Officer
2. Officer's Electronic Appreciation
3. Engineering Technician
4. RCASC Warrant Officer's Conversion
5. Work Study Technician
6. Anti-Tank Guided Missile (Unit Maint)
7. Anti-Tank Guided Missile (Fd Maint)
8. Avionic Equipment Maintenance
9. Aircraft Instrument and Electrical Equipment Maintenance
10. FADAC
11. Electrical Mechanic Group 3A
12. Line and Carrier Equipment Maintenance
13. Vehicle Mechanic Wheeled Group 3A
14. Bobcat Maintenance
15. Body Repairman

HG Conn, Dean of the Faculty of Applied Science, Queen's University, has been appointed to the position of Vice-principal (administration) effective June 1.

Dean Conn has had a long association with the Corps, serving throughout the war and working closely during the summer with the COTC at the RCEME School for many years.

Technical Notes

VEHICLES

TRUCK, 5 TON, 6 x 6
ALL MODELS, SMP VEHICLES

Inspection of Front Axle Universal Joint and Shaft Assemblies

To prevent possible damage to equipment and injury to personnel, all front axle shafts and universal joints on 5 ton, SNL G744 trucks should be inspected for excessive end-play. Excessive end-play of shaft and universal joint will cause the joint to become off-center in relation to the king pin, which may result in binding or possible locking of the steering action.

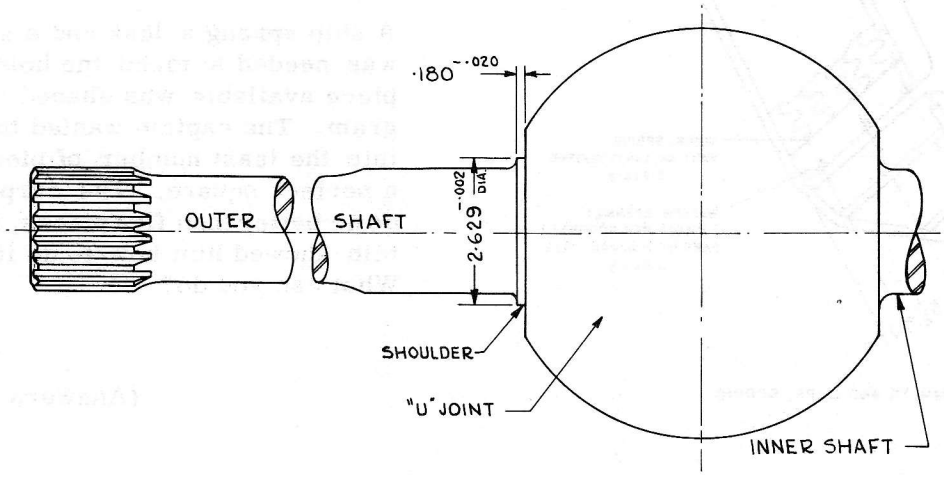
Listed below are the shaft and universal joint assemblies required for the vehicle. Two different assemblies are issued under each stock number and are completely interchangeable, except that Washer, Spacing, Universal Joint Part No 5310-00-734-6986 is not used with one assembly:

Part No	Designation	Qty
2520-00-734-6985	Shaft, w/universal joint assembly, (short)	1
2520-00-734-6984	Shaft, w/universal joint, right, assembly (long)	1

When requesting either short or long axle shaft and joint assembly, Washer, Spacing, Universal Joint Part No 5310-00-734-6986 should be available at the same time to expedite use of the washer if it is required. When installing shaft and joint assembly inspect outer shaft next to the joint to determine if it has a 2.629 minus 0.002 inch diameter shoulder, 0.180 minus 0.020 inch wide (see illustration). If the shaft is provided with a shoulder next to the joint, install washer.

To determine if the washer was omitted when the axle shaft assemblies requiring this part were installed on the vehicle, remove drive flange from the hub and check end-play of the shaft by moving the shaft in and out of the housing. Movement in excess of 1/16 inch indicates that Washer Part No 5310-00-734-6986 was required, but not installed. Movement more than 1/16 inch also indicates that parts are excessively worn and should be replaced.

Some axle shafts have a 1/4 NPS tapped hole in the end for manufacturing purposes. The tapped hole may be utilized for checking shaft end-play by temporarily installing a 1/4 inch pipe nipple, 4 to 8 inches long, a short distance into the threaded hole. Due to the difference between NPS and NPT threads, care should be exercised not to tighten the nipple to the extent it will break off in the shaft.



VEHICLES

RAMBLER STATION WAGON
Antifreeze

Some confusion exists due to the reference in the Rambler Shop Manual, to a special antifreeze known as Ramblergard or Dowgard.

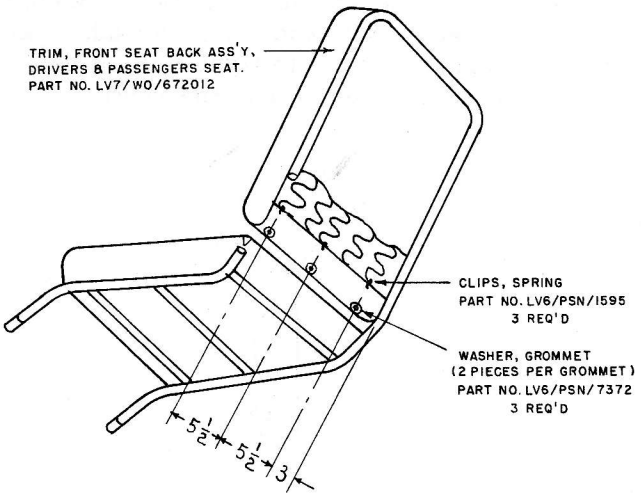
It has been confirmed by the manufacturer that the DND vehicles were filled with a good commercial grade of Ethylene Glycol and may be topped-up with DND antifreeze.

TRUCK, 1/4 TON, M38
Front Seat Back Repairs

When repairs are required to the front seat back on 1/4 ton, M38 trucks, the following suggestions should be incorporated to improve the life of the seat:

Add three grommets and three clip springs as shown in the drawing below.

The grommets permit moisture to drain off and air to circulate and the clip springs prevent the back rest spring from dropping or being pushed down.


TRIM, FRONT SEAT BACK ASS'Y, DRIVERS & PASSENGERS SEAT. PART NO. LV7/WO/672012
CLIPS, SPRING PART NO. LV6/PSN/1595 3 REQ'D
WASHER, GROMMET (2 PIECES PER GROMMET) PART NO. LV6/PSN/7372 3 REQ'D
5 1/2
5 1/2
3

INSTALLATION OF GROMMETS AND CLIPS, SPRING

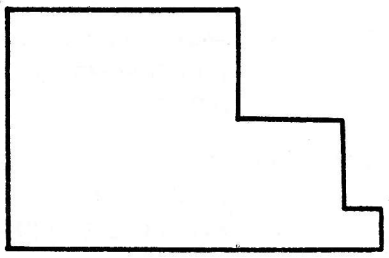
MORE TECHNIC TEASERS

Ready to try something a little harder? The next one seems difficult but it can be solved by following a logical pattern.

6 Express the number 1,234,567 as the difference of the cubes of two consecutive numbers.

And now for a final fling. Can you match the captain on this one?

7



A ship sprang a leak and a square piece was needed to mend the hole. The only piece available was shaped like the diagram. The captain wanted this to be cut into the least number of pieces to form a perfect square. The carpenter could do no better than five pieces, but the captain showed him how to do it with less. What can you do?

(Answers on page 48)

3 INF WKSP REME CUT

—— CANADIAN CAPERS

Most readers will have seen service in Germany, Cyprus, Hong Kong or some other foreign country. But how many have even dreamed of serving in Canada? Twenty-two members of 3 Inf Wksp REME recently had this very pleasant experience. Exercise Pond Jump II involved the movement by air of the 1st Bn Royal Welch Fusiliers and detachments from Supporting Arms and Services. (The detachment from 3 Inf Wksp consisted of Captain Notley, WO II White, S/Sjts Pobjoy and Stockdale, Cpls Ridden, Neave and Homer, L/Cpls Cogings, Howe, Haskins, Nicholson, Shepherd, Daniel and Morrison (ACC), Cfn Field, Stanley, Cheeseman, Young, Morphet, Bates, Armstrong and Wallace).

Most of the Bn group were flown out between 10 and 15 June, the detachment was scheduled to fly from Lyneham at 10 pm on 16 June as part of Chalk 11. Alas, after a few minutes flying, an engine developed a fault, and after jettisoning fuel over the Bristol Channel, the aeroplane returned to Lyneham. It was not possible to prepare another aeroplane that evening, so the Chalk spent the night at Bulford. Next morning at 10 am, there was a repeat performance and once again 'Unlucky Chalk 11' landed back at Lyneham after flying up and down the Bristol Channel. Jokes about the propellors falling off began to grate a little, and there was some speculation as to whether the Chalk would ever leave Lyneham. However, third time lucky, and at 3 pm on 17 June, the aeroplane took off. The flight via Gander, took 18 hours, but no one saw much of Canada until the aeroplane landed at Namao Airfield, Edmonton, at 3 am local time on 18 June. The flight had been comfortable and everyone agreed that the food was excellent. Having had breakfast in the air some surprise was felt when the Canadian reception personnel invited the chalk to take another breakfast. Afterwards, the party boarded two buses and commenced the 130 mile journey to Camp Wainwright.

It was 4 am and the sun was beginning to rise. Eighty pairs of eyes gazed at the Alberta scenery - oil refineries, grain elevators, innumerable small lakes and bungalow style houses. The flatness of the land gave the impression of 'lots of land and lots of sky'.

Who was it who wondered why there were so many seagulls - so far from the sea? There were magpies, and mallard ducks which reminded the sporting type that Canada is considered to be a sportsmans paradise. Occasionally gophers scurried across the road, dodging the wheels of the buses which sped down the highway at 60 mph.

After two hours, the buses arrived at Camp Wainwright and the travellers disembarked to eat their third breakfast. After a few hours rest, members of the REME detachment collected their gear together and four vehicles were drawn from the Camp Ordnance Depot. The temperature was well up in the eighties and there wasn't a drop of beer to be found, as it was Election Day, and this is a dry day in Canada. The detachment survived the shock of this disappointment and motored off into the training area.

The initial move was to Light Company, a forward element of the Supporting Group of 1 CIBG.

Most of the detachment now met the Canadians with whom they were to work for the next five weeks. These hospitable soldiers proved to be good natured and generous and most of them possessed a ready and sharp wit. The next day, 19 June saw the departure of Cfn Morphet to 3 Field Squadron RCE, Cfn Armstrong and Wallace to 3 RCHA, Cfn Bates to the Queens Own Rifles of Canada and Cpl Ridden to Heavy Company. The remainder were destined to remain with Light Company and be integrated with the Canadian forward repair teams.

For the next three weeks everyone lived very comfortably under canvas, although much hard work was done by the members of the forward teams. There were officers' and sjts' messes, canteens, an open air cinema in the evenings and, you'll never believe it, washing machines in the field! Most of the men got away for a swim twice a week, and there were many who found their way to the town of Wainwright, where the Wainwright Stampede proved to be a great attraction. The weather was mainly good with warm days and cool nights.

Day or night, the mosquitoes found the British blood an interesting change from their usual diet, and relief was only certain after DDT spraying by the 'Tiffin Machine' in the evening.

For a while Cfn Field took to trapping, and tried very hard to catch a ground squirrel. Hard luck Field - the ground squirrel is much more cunning than its relative, the gopher.

The 23rd of June was Bde Sports Day, and all units on exercise were given a day off to take part in, or watch the sports. Every British soldier present experienced a feeling of pride when the platoon from the 1 RWF won the Forced March Competition.

Social life in the field was somewhat vigorous. Steak parties and barbecues are very popular in Canada and they were prominent on the social programme. The joint RCOC/RCEME party which was held at Light Company on 27 June was excellent and the barbeque defies description. At this party, Captain Notley, on behalf of 3 Inf Wksp presented a pair of silver candelabra to Major Virtue, OC 1 Field Wksp RCEME. The candelabra were much admired and will be placed in the RCEME School at Kingston, Ontario for use by RCEME units.

1 July was Dominion Day, and after a Church Parade in the morning, there was a Bde Tournament in the afternoon. Teams from all units took part and it was voted a great success. Push-ball or volley-ball, the Brits were quick to learn the technique.

On 9 July the detachment moved out of the training area into Camp Wainwright, prior to going to Calgary to see the famous Stampede on 11 July. Calgary is 280 miles - a 6 hour journey from Wainwright, during which the altitude increases from 2,200 feet to 3,400 feet. Everyone will remember the blue roofed farmhouses, lovely cloud formations, innumerable level crossings and a view of the Rocky Mountains in the distance. Both bus drivers, members of the RCASC were booked by a RCMP patrol car for exceeding 65 mph. Names of townships and cities between Wainwright and Calgary which spring to mind are Airdrie, Red Deer, Rosalind, Irma, Camrose and Wetaskiwin.

The detachment were guests of 1 QOR of C for two nights at Currie Barracks, Calgary.

The Stampede Committee had kindly presented all British soldiers with a complimentary ticket.

The bronco-busting, bull-riding, roping of steers, wild cow milking, chuck wagon racing and musical ride by the Mounties provided novel and interesting entertainment. Most of the lads visited the tepees of the Blackfoot Indian villages and watched the tribal dancing - not so much like the Twist after all. In addition to this, there was all the fun of the fair, and dancing in the streets. All Calgary wore cowboy hats and lariats. Those who invested a dollar or two in the fifty thousand dollar gold brick lottery will be interested to know that it was won by a wealthy Calgary optician.

It was at Calgary that L/Cpl Cogings met his daughter, who had travelled by air from Toronto. She is training to become a doctor.

The brief but worthwhile visit was soon over, and on 12 July the return journey to Camp Wainwright was made by means of 'dooce and a half' Canadian Army trucks. On return to the field, the absence of messes, canteens and washing machines indicated that exercises were about to start in earnest.

When Exercise Sudden Clash started, involving Light Company in four moves in three days, so did the rain, pouring down the whole time, but the webbed footed 'Brits' took it all rather casually. The final location of Light Company was at Borden Lake and everyone was able to take advantage of a cool swim. It was here that some of the detachment saw a satellite travelling across the night sky.

The second Exercise, Counter Power, commenced on 19 July, and who will ever forget that bivouac area and its hungry mosquitoes? Anyway, after a couple of days, back to Border Lake to prepare for the last exercise.

Final Exercise, Lightning Strike, was somewhat different. All British Services were withdrawn from Canadian units and concentrated to form a Neutral Administrative Group under command of Captain Notley. The task of this NAG was to provide a support group for 1

RWF who were acting as enemy. The NAG was a success, and 1 RWF were supplied and repaired throughout the exercise. On the second night the NAG sent out two fighting patrols to raid Heavy Coy and 2 Medium Coy. The umpires ruled that Heavy Coy was blown up although S/Sjt Stockdale and Cfn Morphet were put in the bag. The other patrol met with less success since 2 Medium Coy had been warned of an impending attack.

Nearly everyone collapsed with laughter when a sentry shouted 'Come out there Taff, I got youse covered'.

The Exercise finished on 25 July and everyone returned to Camp Wainwright. S/Sjt Stockdale went off almost immediately to bum a ride by RCAF aeroplane to visit his sister in Hamilton, Ontario. Cpl Ridden visited relatives, and S/Sjt Pobjoy and WO II White stayed with friends in Edmonton. L/Cpl Cogings and Captain Notley returned to Calgary, whilst others visited homes of their serviceman friends in other towns in Alberta. On 30 July the detachment returned from leave and prepared for the move to Edmonton. The move took place the very next day, and as the buses pulled out of Camp Wainwright everyone felt the urge to sing.

But whatever memories of Canada each soldier treasures, whenever Wainwright Camp is mentioned he will recall - the black and white diced water tower between Red and Purple Routes, a vision of 'Field the trapper' with his arms thrust into a ground squirrels hole, and the Tiffin machine laying a white cloud of DDT every evening.

It was on the journey home, at Hamilton Gault Barracks, Edmonton, that Lt-Colonel H. Goodfellow RCEME presented an impressive oil painting to Captain Notley, who accepted it on behalf of 3 Inf Wksp REME.

On 18 August the detachment emplaned at Nameo Airfield and flew home via Gander. There is no doubt whatever that the visit to Canada had been enjoyed at all. Most of the REME personnel made good friends, and they know more about their Canadian counterparts. Exercise Pond Jump II will remain a pleasant memory. Already someone has asked 'Will there be a Pond Jump III'?

-The Craftsman

EDITOR'S NOTE

The painting presented to 3 Inf Wksp REME is the work of Mr J Gordon Sinclair, a well known Edmonton artist and long-standing member of The Alberta Society of Artists. Entitled "The Three Sisters", the painting is a magnificent portrayal of a famous landmark in the Canadian Rockies. It was selected personally by Major Virtue as an appropriate reminder to our British visitors of their eventful stay in Canada.

EXERCISE CHAINMAIL

Lt Col CG Provan the RCEME DS at Canadian Army Staff College, recently asked The RCEME School to assist in the conduct of Exercise Chainmail by providing visitors of various categories to test the reaction of student staff officers to the various problems which sometimes arise during operations.

The Subalterns EME class was detailed for this task and the attached photograph shows how they were prepared by Staff College to represent visitors ranging from a distinguished senior officer through to prisoners of war officers and from allied armies to irate local farmers.

Second row from l to r: Lt GT Lake, 2Lt WR McCaughan, 2Lt PL Pothier, Lt JH Hayward
First row from l to r: Lt P Rouillard, Lt JLRL Langevin, Lt RG Patterson, Lt JG Meek, Lt ID Isbester, Lt RB Manning

SUGGESTION AWARDS

Sgt JI Freeman

The proposed method of checking the nitrogen pressure on the 105 mm Howitzer effects a saving of 77 man/minutes.

The proposed method eliminates the retracting crank. This crank weighs 56 lb and requires storage space measuring 27 1/2 inches x 9 1/2 inches x 8 1/4 inches. It requires approximately 60 lb effort on the retracting portion and approximately 15 lb effort on the runout portion. This crank is at present issued as 1 per battery and 1 per LAD or workshop and is used only for this job.

The proposed method uses the hydraulic pump liquid which requires approximately 15 lb effort on the retracting portion and no effort on the runout portion. This pump is at present issued as 1 per battery and 1 per LAD or workshop, and is used for other jobs.

The proposed method is as accurate if not more so than the present method and is similar to the method employed on the 155 mm Howitzer detailed in the EME Manual Weapons R 503 Instr 2. It will tend towards standardization and will be easier to teach new tradesmen.

WO 2 E Doherty

WO 2 E Doherty of 212 Workshop RCEME, Camp Shilo, was recently presented with a Suggestion Award submitted while employed at 202 Base Workshop in 1959.

At a unit parade, Col WS Hunt Commandant, Camp Shilo, presented WO Doherty with a cheque for $65, with the certificate and a personal letter of congratulations from the QMG.

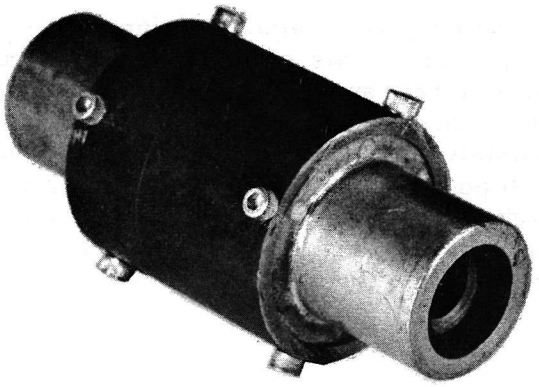
A brief summary of the suggestion follows:

"In the past, two operations were required to remove paint and rust from small arms components: immersion in a tank of paint solvent and sandblasting to remove rust. The suggestion proposed using an alkaline solvent that would do both operations at once".

SLAVE CABLE JUNCTION BLOCK

ACKNOWLEDGEMENT

This item was suggested by Cpl LW Thompson of 8 Canadian Hussars, Light Aid Detachment, RCEME and is under consideration by the Suggestion Award Committee.



PURPOSE

To provide a junction block for connecting Centurion tank slave cables.

DESCRIPTION

The slave cable junction block and its components are illustrated below:

ASSEMBLY

a. Assemble two components consisting of items 20 to 29 inclusive, plate L50, Centurion tank spare parts list 12115.

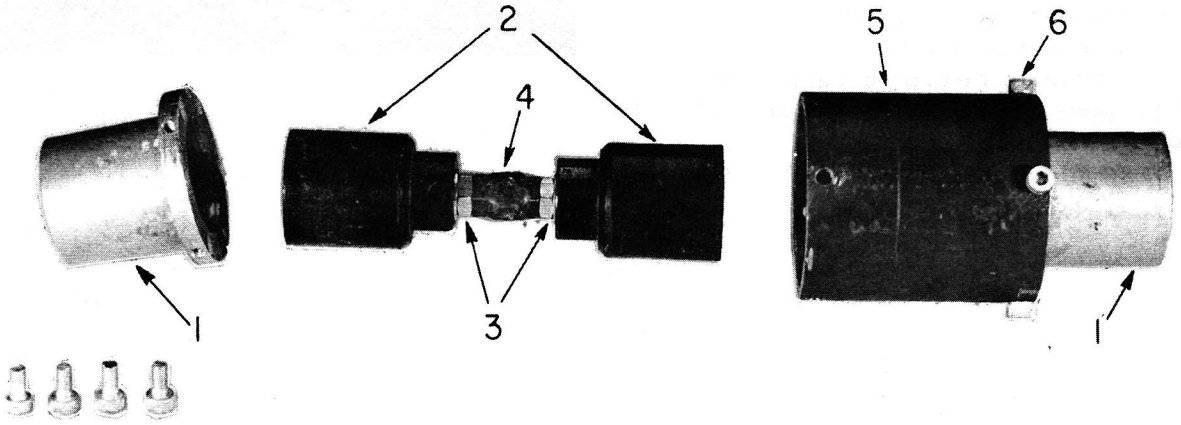
b. Weld together two nuts, item 14, plate L50, so that the piece formed is 13/16 inch long. A piece of 1/2 inch hex stock 13/16 inch long drilled and tapped to the thread size in the two nuts may be used instead of the two welded nuts.

c. Connect the two components mentioned in para a with the two welded nuts.

d. Enclose the connected components with a piece of steel pipe 2 1/8 inch inside dia 2 7/8 inch long so that the two flanges are flush with the ends of the pipe.

e. Drill four 5/32 inch holes through the pipe and into each flange to a depth of 1/4 inch. Space the holes equally around the pipe. Tap each hole with a 2 BA thread.

f. Insert eight allen cap screws 2 BA 3/8 inch long to hold the assembly together.



The majority of the above components are not available from stock and as fabrication is considered too costly it is felt the necessary components can be made available from salvage and assembled under the provision of EME Manual Management H 400.

ADVANTAGES

The junction block enables slave cables to be connected together and offers a solution for starting a Centurion tank with dead batteries when the distance between tanks, as a result of terrain or tactical situation, is too great to permit starting with a single cable.

For the most efficient slave starting of the Centurion main engine two cables are the maximum that should be connected; however there are occasions when three cables may be joined and successful 'slaving' achieved.

When the slave cable is used to start the Centurion auxiliary generator, as many as nine cables may be connected with satisfactory results.

LEGEND

1. Item 20 and 24 plate L50, Centurion spare parts list 12115.
2. Items 21 to 23 and 25 to 29 inclusive, plate L50 spare parts list 12115.
3. Item 14 plate L50 spare parts list 12115.
4. Weld.
5. Steel pipe 2 1/8 inch inside dia 2 7/8 inch long.
6. Allen cap screw 2 BA 3/8 inch long.

CONTRACTS QUIZ

By Mr HC Mussell

1. Sgt Black the contract NCO enjoyed the Mess Party, particularly dancing with the little blonde who came with the Provost Sgt. Sgt White has been asked to take over as contract NCO until Sgt Black is released from hospital. Sgt White's first task is to pick up a truck from the local garage which has been completely overhauled. He is quite satisfied that the work has been properly completed, and the invoicing is in accordance with the contract, but the box of old parts in the cab presents a problem. Should he:
   a. tell the garage owner that we are not interested in old junk?
   b. say that the parts must be cleaned, tagged and a list made in 7 copies?
   c. take them back to the workshop, tag and list them himself, turn them into the SPSS and get a receipt for them?
2. Major Green, CO 88 Coy and Area EME Southern Area feels that Capt Brown, OC 999 Workshop (100 miles away) should have LPO signing authority. Can he delegate to Capt Brown?
3. Sgt White, previously mentioned, has an IHC 3 ton engine for complete overhaul. The local IHC dealer cannot provide an exchange, and does not overhaul engines so the job must be done by PR through DDP. Sgt White being an instrument technician and new at the contract job does not know what amount he should put in the "estimated cost" column of the PR. City Engines Ltd have offered to completely strip the engine and give him a firm price for the job. Should he go along with this offer?
4. Sgt Black is back on the job. The first day on he gets a DEWAO from a Chrysler dealer which shows parts at trade price. Previously Chrysler DEWAOs showed parts at list at less 25 per cent. Can he initial Block II that the dealer's prices are in order?

(Answers on page 37)

AIRCRAFT MAINTENANCE COURSE
UNITED STATES ARMY AVIATION SCHOOL,
FORT RUCKER, ALABAMA, USA

RCEME craftsmen graduate from Single Rotor Turbine Utility Helicopter Maintenance Course. This is one phase of a four-part course to qualify tradesmen as Helicopter Technicians. On successful completion of training at Fort Rucker, these men will be posted to CJATC, Rivers, for upgrading training.

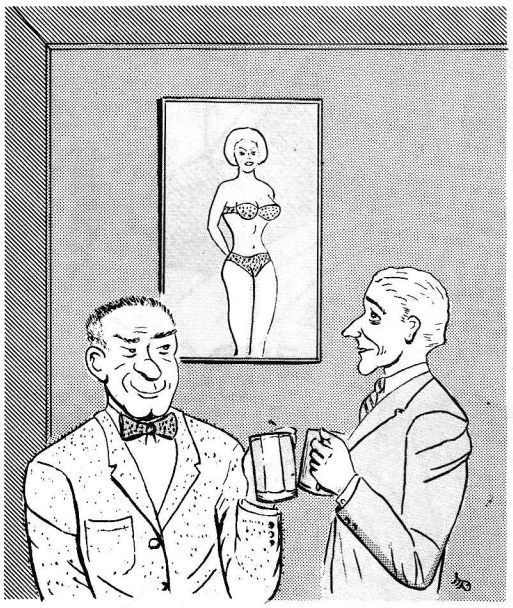
Our picture shows Col WR Williams, Jr, Assistant Commandant, awarding diplomas to:
(front row) Cfn JW Clark, GD Good, RC Leworthy, FT Wayte;
(rear row) LW Covyeow, LJ Heatherly, WR Durie, PA Puddicombe. Maj JA Beament, Canadian Liaison Officer, is at extreme right.

ACCIDENT STATISTICS

By Maj HE McLaughlin, MBE, CD

Every year the Management Section in DEME churns out an enormous summary of accident statistics. We sometimes wonder how many people read it, and how it compares in popularity with such widely read publications as that grand old EME Manual K 010!

So... having regard for the legendary dryness of all figures produced in massive quantities, our office decided to investigate and publicize just one accident - No 313, classification "Objects falling onto people's heads". This little incident involved two close friends, Cpl Neville Neatby and Cfn Malcolm MacFudd. Certain confidential information led us to believe that the accident had its beginnings in a modest little waterfront hotel called "The Broken Arms". Here we look in on our heroes enthusiastically toasting the obvious talent of their favorite movie queen, Sophia Bardot.



"A Toast to Sophia"

The following day found the two tradesmen hard at work in the local RCEME workshop. Cpl Neatby, tuning up a motor, had his tools laid out in precise order within handy reach. Cfn MacFudd was skilfully wielding an electric drill below. The Cpl, mentally recounting Sophia's outstanding charms, shuffled his feet in appreciation. Suddenly his heel nudged a "technician's friend" - the next page takes you directly to the scene of this sorry drama...

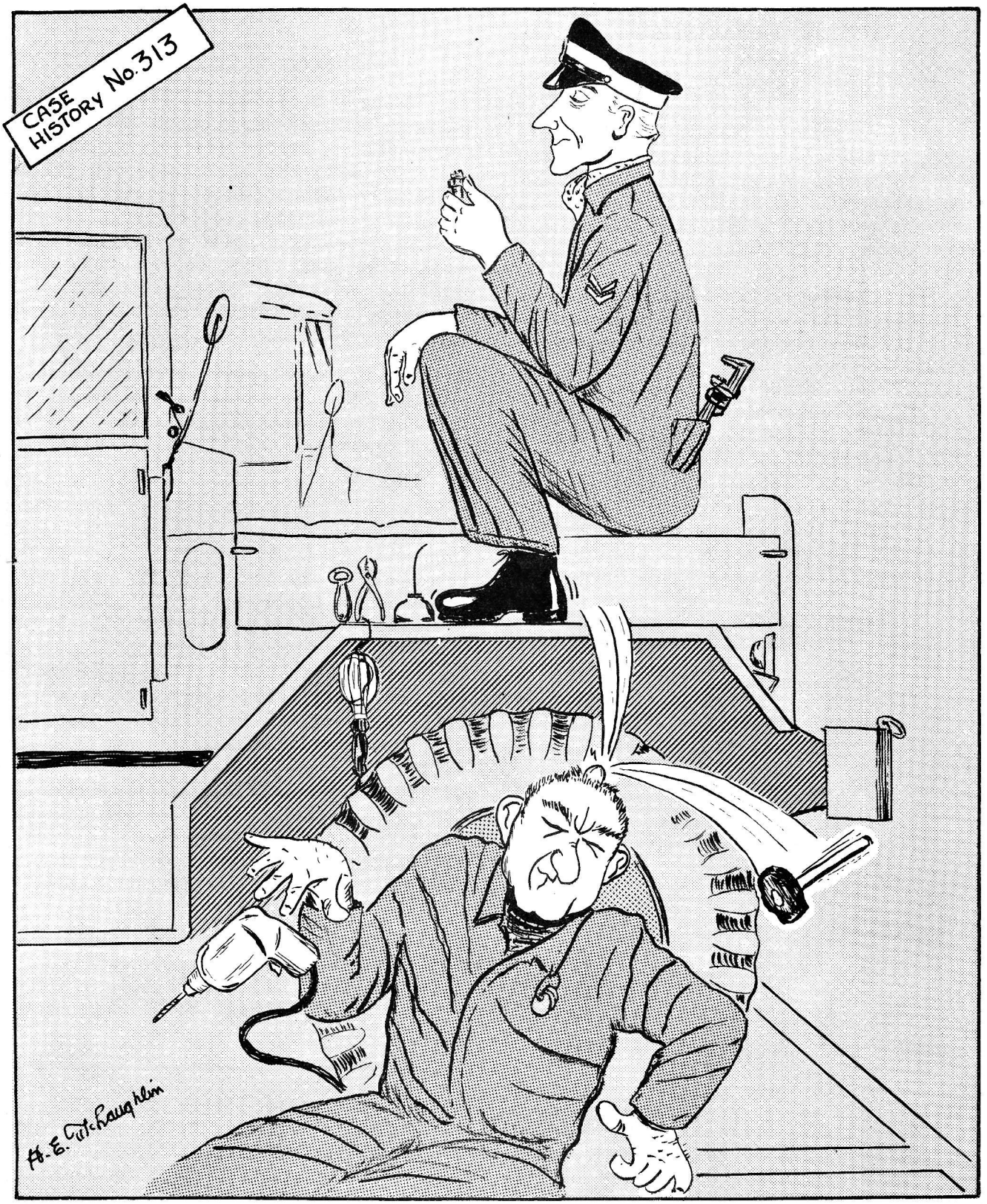
Answers to Contracts Quiz

1. None of the alternatives is correct. Old parts are returned only to ensure that new parts were installed, and for their salvage or rebuild value. If Sgt White is satisfied that the new parts were installed in the truck, he should bring the old parts back to the workshop in bulk, turn in accountable parts to the SPSS on the work order and throw the remainder in the workshop salvage. The workshop copy of the invoice is then certified that unserviceable parts were returned to RCEME.

2. No. His delegated authority cannot be redelegated. However he can recommend that the Area Commander delegate authority to Capt Brown in any amount up to $250 per LPO.

3. No. City Rebuilders may have made the offer with no ulterior motive, but if the engine is stripped in their shop, it would be almost impossible for DDP to award the job to another tenderer. The estimated cost on the PR is really not too important. If the lowest tender is within 15 per cent of the PR amount, DDP can award the contract without coming back to RCEME; if it exceeds the PR by more than 15 per cent, DDP merely ask for a PR amendment. If the tender is less than the PR amount, the surplus is automatically returned to us when the contract is received by treasury. Therefore in this instance the cost of rebuilding a similar size engine, a telephone estimate from a rebuilder or even a "Dandy Sandy" or "Timpson-Tears" price list would be better than allowing City Rebuilders to strip the engine.

4. Yes. Chrysler has now changed their price list to Suggested List and Trade, similar to Ford, GM and IHC. Trade price is acceptable and the agreement and instructions will be amended.


CASE HISTORY No. 313
A. E. McLaughlin

OCCUPATIONAL HEALTH

Human muscles aren't yet obsolete in industry. Statistical support of this statement is contained in the Alberta Workmen's Compensation Report for 1960 which records 6,663 claims for back injuries due to strain in that year, or 14.3 per cent of all claims. In Montana, nine out of ten back injuries reported to the Industrial Accident Board of that State are sprains or strains.

Frequently occupational injuries to the back are of a minor nature; occasionally they result in permanent disability and exact a high price in human suffering and in dollars. In Ontario, in 1959, back injuries averaged $509 for each Workmen's Compensation Board claim. One year later, the cost per claim had risen to $576.

These facts pose certain questions: How and why do such injuries occur? Is man's physical make-up responsible and, if so, in what way?

PHYSIOLOGICAL CAUSES

The Spine

Visualize the complicated structure called the spinal column with its 33 vertebrae, each of which has seven bony projections to which muscles and ligaments are attached and which seem to stick out in all directions. The ligaments attach one bone to another, forming joints, and permitting motion between them. Between the joints of the vertebrae are the discs. Coin-shaped and of a hard, gelatinous substance, they act as shock absorbers.

If one could see the mass of ligaments, discs and muscles that hold the spine together and make it move, one would be amazed at the intricacy of this truly mechanical marvel.

LIFTING AND CARRYING

But the structure of the spine is not only complex; it is unstable as well. Designed by nature to function in a horizontal rather than vertical position, the spine gradually developed an upright posture. This development has resulted in a mechanism with the center of gravity balanced rather precariously over a small base and requiring great and constant muscular activity to maintain this position.

To this complex mechanism has been added the use of the hands and arms as long levers to grasp objects, but at an unfortunate mechanical disadvantage, as the forces are expended on a localized area of the spine.

Muscles and Ligaments

As stated previously, the ligaments determine the extent of motion in each individual joint. Within these limits, motion is controlled by the muscles that bridge the joint. Each ligament has its maximum strength, elasticity, and contraction power. When forced beyond these limits, it suffers functional and organic injury. When on guard, the muscles protect the ligaments to their utmost ability. Beyond this, the force is exerted on the ligaments. Sudden unexpected application of force may injure the ligament before the muscles are alerted.

BACK INJURIES

Thus the complex, delicate mechanism of the spine is a predisposing cause of back injuries. Although herniated and otherwise damaged discs appear on the list of such disabilities, sprains and strains are the most common type of injury.

Sprains and Strains

A muscle may be strained during deliberate effort at too great a task or by sudden increase of load. Its structure gives way with a severe tearing pain which immediately inhibits further effort and induces a protective spasm that immobilizes the part The individual has difficulty straightening up if stooped, and any

motion that adds tension to the injured muscle increases the pain. There is tenderness to pressure on the affected muscle.

A sprain is the tearing or stretching of a ligament. These are tough, somewhat elastic fibrous structures so strong that they, sometimes pull off a section of bone rather than give away.

Failure to appreciate the pathology of back sprain and strain and the time required for healing of torn ligaments and muscles has resulted in a great waste of manpower and great loss of employee loyalty and plant morale. Employees returned to work too soon are subject to recurrence of disability and permanently diminished back stability. Consequently, some industries have designed a program aimed at preventing back injuries.

PREVENTION PROGRAMS

Obviously details of a prevention program will vary according to the needs of a particular industry, but the National Safety Council has suggested that when a procedure for the safe handling of materials is being planned, the following four points should be emphasized:

Selection of employees.

Training of employees in correct methods of lifting.

Supervision.

Use of tools and aids, plant layout.

Selection of Employees

Unfortunately the same care exercised in ensuring that a truck or crane has the capacity to do the job for which it is purchased is not always used in assigning employees to their jobs. Often the manual handling of materials is regarded as a task for unskilled labour, so men are assigned to it because they are unfitted for jobs requiring greater skills. Also, when an extra man is needed to move rush-order material, he will be one who can be spared from another job. He may not have been taught to lift correctly, or he may have defects in his anatomy which cannot stand unusual strain.

Pre-employment examinations, conducted carefully by a physician familiar with the plant's needs, will prevent many an employee being assigned to a job beyond his capacity. A man with a predisposition toward hernia, for example, should not be placed on any job involving physical strain.

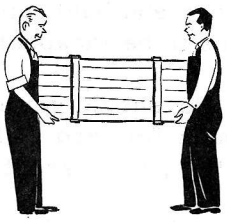
Nor should men be selected merely on the basis of appearance. Some small, wiry men can handle heavier loads than many taller, heavier men. The burly fellow may have a heart condition, high blood pressure, poor vision or other ailment that might affect his ability to do certain work. Only a medical examination will reveal these defects.

Many of these people can be restored to reasonably sound physical condition through medical treatment, although their job assignment should be carefully watched. Details of these physical examinations should remain confidential between doctor and patient. Foremen, however, should be informed of a worker's physical limitations and instructed to avoid assigning him to jobs that might aggravate an existing disability.

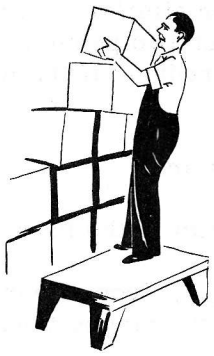
The Wrong Way

The Right Way

Not Like This



Like This



Use Platform to Maintain Balance

Watch for Nails, Jagged Edges

An employee's temperament should be considered also. A fast-moving person - one whose physical movements are quicker than his mental processes - may endanger both himself and other members of his team.

Training of Employees

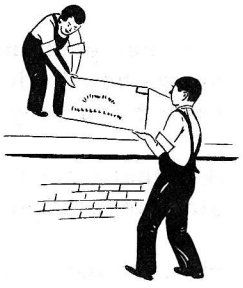
Once employees have been selected, they must be trained because there is a definite knack to lifting and carrying. Seldom is it instinctive; it must be taught. Instruction in these skills might include the following points:

Use Skill, not Force

Lifting depends to a great extent on the skilful use of the right muscles, and not on brute force. The untrained person will usually bend from the waist, using back muscles to lift the load. The experienced man crouches as close to the load as possible with his legs bent at about a 90-degree angle at the knees; his back as straight as possible. In the proper position, leg muscles are in tension, ready to do the work. Back muscles are locked so that the back is held rigid. To lift the object, he straightens his legs, at the same time swinging his back to a vertical position.

Never Carry Blindly --- or Too Much

Jerking is Dangerous



Better This Way

The Wrong Way

The Right Way

Get Help if Load is Too Heavy

When a packing case or similar load has to be manhandled by at least two people, the probability of strain will be reduced if the men are of similar height.

Six additional pointers are:

Grip with the whole palm of the hand.

Lift by easy stages, ie, from floor to knee, from knee to carrying position.

Keep the feet 8 to 12 inches apart to ensure balance.

Do not twist the body while lifting or carrying.

Carry with arms close to sides and fully extended.

Lower the load by bending the legs with back and arms straight.

Avoid Excessive Loads

An excessive load may seriously strain even the trained and experienced worker. If it approaches or exceeds fifty per cent of the individual's body weight, the risk of injury from possible loss of balance is a real one. Opinions vary as to the weight which an individual can safely carry. According to the US Department of Labor, men never should lift more than 50 pounds unaided. Women should lift no more than 25 pounds. The National Safety Council suggests that men should lift not more than 75 pounds or half their own weight, whichever is less. Women should lift no more than 35 pounds or a third of their own weight. Physical differences, however, make it impractical to set up safe lifting limits for all workers.

Examine Lifting Areas

Frequently accidents are caused by the dropping of a load on the feet. It is a good policy to take a look first at the lifting area ... clean up slippery or oily parts of the floor and remove anything likely to cause obstruction and subsequent disturbance of natural balance.

Never Jerk, Shove and Twist the Body

These movements abuse and strain arm, shoulder and back muscles and may cause the worker to be incapacitated for many weeks.

He should get help whenever necessary and push forward with the arms, steadily and smoothly, back erect.

Stack or Pile no Higher Than Chest

Stacking or piling at too high a level causes fatigue and serious strain. Don't wait until the stack is so high that the load has to be jerked up and forward above head level. Get a pallet platform to stand on or something similarly firm and giving a comparable standing area - an essential for maintaining perfect balance - and stack only chest high.

Keep Hands from Being Injured

Splinters, nails, jagged edges, all are hazards frequently and easily overlooked. When putting down the load, make sure the hands and fingers are free before dropping it; above all, before attempting to carry anything rough or jagged ... remember, gloves in use are worth any number in store.

SUPERVISION

Training men in correct methods isn't enough. They must be observed on the job to make sure they are following the methods they have been taught. The important parts of a foreman's job are to:

See that each man working under him knows how to do his job according to accepted company rules and practices.

See that employees follow rules and standards faithfully.

Instruct and correct employees intelligently so that they will understand fully how to do their jobs and realize the advantages of following directions.

Develop and keep employee loyalty and respect. Each man should be made to feel the importance of his job.

EQUIPMENT AND LAYOUT

But even with skilled, careful workers and competent supervision, human failure or job variations may occur. Handling materials offer plenty of chances for these. Frequently the use of special tools and protective clothing will minimize such risks.

Handling material is made easier and safer by the use of a wide variety of hand or hand-operated tools, jigs and other devices.

Hooks are used for handling logs, lumber, crates, boxes and barrels where the object will not be damaged. Hooks should be kept sharp and used so they will not glance off hard objects.

A bar may be used to obtain leverage when moving objects. The point or edge should be kept sharp to prevent it from slipping.

Many of these primitive devices have received new refinements. Light-weight metals and ball bearings make these devices easier to move.

Nevertheless, even simple equipment needs careful maintenance. Handles get broken and need replacement; regular lubrication cuts down the effort needed to push or pull vehicles.

Protective clothing is desirable on many handling jobs. Stout work gloves and safety shoes are basic protection while more specialized garments are needed for handling hot or sharp objects.

Good plant layout will reduce the amount of lifting and carrying required and will thereby make these jobs easier and safer.

CONCLUSION

Far from being obsolete, human arms and backs are extensively used for handling material in this machine age and need the care that a comprehensive preventive program can provide. Experience has demonstrated the value of such a program in reducing both the frequency and severity of low back injuries.

-National Health Bulletin

RCE MEMORIAL SCHOLARSHIP FUND

Out of sixteen $125 scholarships awarded to outstanding students of engineering, architecture and applied science in 1962, four went to RCEME cadets. These are selected from 18 universities and colleges across Canada, and preference is given to sons of serving or former members RCE.

The four, selected for academic achievement and leadership qualities, are:

Lieut DA Grantham at Nova Scotia Tech
O/Cadet J Sanders at UBC
O/Cadet VB Suddaby at U of Sask
2/Lieut JRG Chenier at U of Ottawa

This Fund in memory of Royal Canadian Engineers killed during the war, was established toward the end of the Second World War, the inspiration of Lt Gen Geoffrey Walsh, CGS, then CE of the Canadian Army overseas. Voluntary subscriptions of some $35,000 from all ranks RCE, in 1944-45 created the fund, from which 159 awards have been made since the first in 1949.

WHO'S WHERE

BRIGADIERS

JW	Bishop	Comd HQ BC Area	KH	McKibbin	Comd HQ West Ont Area

COLONELS

CW	Jones	CO 202 Base Wksp	A	Mendelsohn	DEME
WS	Hunt	Commandant Camp Shilo	KR	Ward	Commandant RCEME Sch
EC	Mayhew	Chief Superintent AEEE			

LIEUTENANT COLONELS

VW	Bethel	DSO&P	EC	Ilott	DEE
GW	Bruce	DEME	GT	Kirk	HQ RCEME Eascom
DA	Campbell	DEME	AHR	Lewis	Br Comp Gen (DMCM)
GG	Cavaghan	D Pers (Plans)	AGM	Maitland	MAS London, Eng
HL	Cohen	AEEE	AL	MacLean	DEE
EW	Coleman	DEME	IM	McLaughlin	Cdn Arsenals Ltd
KF	Collins	AEEE	WJ	Owens	RMC of S (DS)
JC	Currie	AEEE	CG	Provan	CASC (DS/GSO1)
WM	Dalrymple	204 Base Wksp	AM	Reid	DEME
CMR	Elmsley	DEME	ANP	Roberts	DEME
H	Goodfellow	HQ RCEME Wescom	HM	Robinson	HQ RCEME Quecom
WG	Hamilton	HQ RCEME Cencom	JP	Sherren	DEME
RHC	Hodgson	DEME	GW	Thompson	DEP

MAJORS

J	Adams	202 Base Wksp	WE	Ellis	2 Coy
RW	Anderson	Retiring	HHE	Erb	RCEME School
BE	Babcock	204 Base Wksp	RF	Fendick	HQ 3 CIBG
HC	Banham	Retiring	JJ	Garnett	C&D CALE (Exch Offr)
P	Bateson	TAHQ Calgary, Olds Alta	DV	Geary	204 Base Wksp
CH	Betts	DEME	SA	Girdler	DEME
JC	Boughton	DADEME HQ 4 CIBG	WH	Glover	RCEME School
EM	Brignell	14 Coy	WJN	Haggins	CJATC
DD	Campbell	3 Coy	HV	Hann	202 Base Wksp
DG	Carlyle	DQMG (EE)	EJ	Hare	DEME
FW	Chapman	Pers RCEME	EJO	Harvey	RCEME School
HW	Chapman	BEME HQ 4 CIBG	TR	Heal	204 Base Wksp
JF	Clarabut	HQ RCEME Cencom	CB	Hellyer	CAORE
BC	Clerke	DEE	EF	Hendricks	DEME
EW	Cole	4 Coy	HW	House	DEME
JH	Coombe	Retiring	CA	Hurst	7 Coy
FE	Cooper	13 Coy	AJ	Jeffery	5 Coy
KLF	Coupland	RCEME School	FG	Johnson	DEP
BB	Cox	8 Coy	EG	Jones	War Office
EB	Creber	CASC	KR	Joslin	4 Fd Wksp Incr A
AM	Croft	AEEE	FR	Kaye	HQ RCEME Wescom
JJE	Cuddihey	18 Coy	VD	Kenyon	CALE
BM	Diebert	202 Base Wksp	HLM	King	AEEE
FL	Demone	6 Coy	JS	Kitto	RCEME School

CG	Lawrence	7 Coy
RW	Libbey	DEME
JL	Loughbridge	1 Coy
LH	Love	AEEE
RL	MacDonald	204 Base Wksp
ALD	Macdonell	Ex Officer UK
JH	MacLean	AEEE
RA	McKay Keenan	Detroit Arsenals
HE	McLaughlin	DEME
GP	Miggins	12 Coy
DR	Mowbray	DEME
DA	Nicholson	HQ RCEME Eascom
PH	North	CASC
GL	O'Brien	DEE
KS	Parton	13 Coy
HCR	Pfeiffer	DEE
JN	Pinder Moss	AEEE
HA	Popkin	202 Base Wksp
CG	Racicot	HQ RCEME Quecom
W	Rhodes	AEEE
RC	Rivers	202 Base Wksp
M	Ruscher	War Office
LA	Sainsbury	DEE
GD	Savage	11 Coy
IC	Scarlett	DEE
FJ	Sergi	DEE
RN	Shaw	RCEME School
WR	Shaw	HQ 4 CIBG
JO	Sheehan	DEE
JL	Sloan	AEEE
WG	Svab	2 Fd Wksp
SG	Tait	202 Base Wksp
AR	Thomsen	16 Coy
DJ	Tidy	56 Cdn Inf Wksp
JM	Treleaven	Br Comp Gen
JD	Trevithick	AEEE
PA	Tuck	3 Fd Wksp
WW	Virtue	1 Fd Wksp
RW	Vollett	US Army Chem School
EA	Williams	10 Coy
WR	Willing	DEME
GA	Wright	CAS (W)
B	Yarymowich	ATOB (Petawawa)

CAPTAINS

KI	Anderson	6 Coy
LW	Armstrong	2 Coy
GE	Ball	204 Base Wksp
NE	Birchard	DEME
JMF	Bourassa	202 Base Wksp
GN	Brent	DEME
JE	Brewster	11 Coy
JE	Brown	DEME
PL	Burcombe	202 Base Wksp
FJ	Burton	202 Base Wksp
GR	Burton	RCEME School
CO	Bush	HQ RCEME Cencom
LN	Bydal	Redstone Arsenals
LJE	Byer	4 CIBG LAD
JL	Calvert	8 Coy
JNR	Campbell	12 Coy
WM	Campbell	11 Coy
AB	Cantlon	RCEME School
FR	Carruthers	RMC (DS)
G	Charles	13 Coy
TM	Chell	CAS (W)
JE	Coates	3 Coy
WG	Collins	RCEME School
RDL	Connell	CJATC
JH	Cooper	4 Fd Wksp Incr 'E'
JN	Courtney	CASC
DH	Cumming	RCEME School
DH	Curling	FGH LAD
PR	Dack	RCEME School
LA	Daviss	202 Base Wksp
JD	Delaney	14 Coy
FF	Doherty	DEME
JGR	Doucet	2 Fd Wksp
OA	Edmond	204 Base Wksp
AS	Etter	2 Fd Wksp
RJ	Francis	1 RCHA LAD
DH	Fraser	DEME
AM	Gilbert	DEME
FB	Goring	1 Coy
RE	Goulding	56 Cdn Inf Wksp
NA	Graham	4 Fd Wksp
GE	Grainger	AEEE
JR	Griffin	AEEE
ADL	Grinham	Retiring
WJA	Groom	DEME
GM	Hagan	RCEME School
DV	Hampson	RMC of S
PEV	Hansen	RMC of S
RT	Hare	11 Coy
FA	Hlohovsky	Suffield Exp St Ralston A
O	Howard	202 Base Wksp
AW	Hughes	Retiring
RG	Humphreys	11 Coy
FG	Hutson	CJATC
WR	Hyman	202 Base Wksp
AF	Johannes	4 Fd Wksp
MC	Johnston	AEEE
JJ	Kane	202 Base Wksp
JR	Kaye	1 CIBG LAD
GW	Keays	LdSH LAD
KT	Kennah	DEME
JJ	Klinec	DEME
NE	Laviolette	BEME 4 CIBG
JW	Lelacheur	RMC of S

AC	Leonard	RMC (DS)
WF	Lucano	Queen's University
AM	MacDonald	RCEME School
JA	MacDonald	RMC (DS)
AJ	MacGillivray	8 CH LAD
RL	MacIntosh	RCEME School
RMG	MacKenzie	14 Coy
RH	MacLeod	CADEE
E	MacMillan	3 Coy
DM	Maher	DEME
MG	Masuda	Queen's University
GD	McCulloch	Queen's University
JD	McDougall	DEE
JS	McIntyre	DEME
MD	McKinlay	Queen's University
CA	Millar	AEEE
RW	Miller	16 Coy
TME	Mimee	RCEME School
JF	Moore	DEME
CR	Morgan	4 Coy
JL	Moyse	204 Base Wksp
PB	Nicholson	DEME
WH	Norton	Pers RCEME
JF	O'Connor	202 Base Wksp
STA	O'Farrell	CJATC
JR	O'Neill	DEME
FA	Ouimet	5 Coy
TW	Oxley	204 Base Wksp
TR	Palfrey	16 Coy
JE	Peacock	DEME
DB	Perrin	2 RCHA LAD
WC	Perry	202 Base Wksp
JR	Peters	10 Coy
R	Peters	AEEE
PP	Pospisil	56 Cdn Inf Wksp
CH	Putt	DEME
JR	Raby	4 Fd Wksp
JA	Remington	1 Fd Wksp
JA	Richards	RCEME School
GS	Rippengale	56 Cdn Inf Wksp
HL	Robinson	56 Cdn Inf Wksp
V	Roddick	18 Coy
HA	Rosson	4 Fd Wksp
WGL	Russell	202 Base Wksp
DA	Saunders	RCEME School
RB	Screaton	RCD LAD
WJ	Shearing	3 RCHA LAD
WD	Sneddon	RCEME School
JA	Stott	7 Coy
EJ	Stow	10 Coy
GW	Swallow	DEME
WA	Thomas	RCEME School
RH	Thorn	RCEME School
HK	Warren	RCEME School
BH	Wright	DEME
DE	Wilson	3 CIBG LAD

LIEUTENANTS

AM	Adams	3 Fd Wksp
GW	Anscomb	RCEME School
GF	Bews	AEEE
JF	Boudreau	3 Fd Wksp
W	Boychuk	5 Coy
FN	Brodie	7 Coy
HD	Byer	3 Coy
CA	Churchill	AEEE
EM	Conway	8 Coy
RF	Conway	16 Coy
WWD	Cruden	RCEME School
JS	Davies	4 CIBG Incr 'A'
JHJD	Delisle	10 Coy
JP	Durocher	5 Coy
HT	Edworthy	RCEME School
JAFL	Gagnon	RCEME School
PM	Graye	4 Fd Wksp
GT	Hammond	D Org
LM	Harvey	202 Base Wksp
JH	Hayward	202 Base Wksp
TW	Healey	5 Coy
JML	Hebert	7 Coy
HJ	Hellard	RCEME School
KW	Henderson	4 Fd Wksp
DV	Hill	12 Coy
ID	Isbester	16 Coy
DC	Kaufman	7 Coy
HG	Kayne	4 Fd Wksp Inc 'D'
JMA	Lachance	RCEME School
GT	Lake	2 Fd Wksp
JLRL	Langevin	8 CH LAD
FH	Leach	CJATC
JWLP	Lee	3 Fd Wksp
LA	Leflar	16 Coy
FG	Legg	LdSH (RC) LAD
JPR	Levesque	8 Coy
GE	Maguire	RCEME School
GK	Maguire	DEME
RB	Manning	RCEME School
AE	Marble	Nova Scotia Tech
AL	McEachern	16 Coy
DG	McKay	Retiring
LF	McLeod	HQ RCEME Wescom
JG	Meek	10 Coy
HJ	Millen	13 Coy
HG	Morgan	FGH LAD
HA	Patterson	DEME
RG	Patterson	7 Coy
CA	Penny	RCEME School
RH	Purton	DCER
GA	Riley	10 Coy
WD	Roche	4 Coy
EA	Rochefort	13 Coy

CE	Rooney	11 Coy
AG	Rose	HQ RCEME Wescom
JAP	Rouillard	202 Base Wksp
JGHL	Roy	1 Fd Wksp
DL	Smith	RCD LAD
JH	Spackman	2 Fd Wksp
WRL	Springford	1 Fd Wksp
JT	Thompson	202 Base Wksp
JLF	Tremblay	RCEME School
JMR	Turcotte	3 Fd Wksp
RL	Walker	202 Base Wksp
B	Wong	1 Fd Wksp
Z	Yarymowich	2 Fd Wksp

SECOND LIEUTENANTS

KD	Baird	RCEME School
JGC	Desjardins	RCEME School
GWE	Godson	5 Coy
JI	Hanson	RCEME School
WR	McCaughan	HQ RCEME Eascom
JJG	Moreau	RCEME School
GP	Pothier	6 Coy
CF	Potter	13 Coy

ROTP CADETS

J	Allaire	Laval	DG	Dinsmore	RMC	OS	Oishi	Alberta
GA	Bardet	RMC	JA	Dixon	NB	JAR	Parent	Laval
CJ	Belisle	RMC	RJ	Ferguson	Toronto	TR	Patterson	NB
RG	Bell	RMC	RN	Fischer	RMC	NE	Pothier	NSTC
RE	Betzner	Sask	RR	Fraser	RMC	HG	Ray	Sask
DL	Black	NB	JJ	Fyfe	RMC	J	Sanders	BC
A	Boucher	Laval	MJJR	Giroux	RMC	FG	Scagnetti	Toronto
R	Boyko	RMC	JCR	Godin	RMC	BH	Simms	NSTC
RP	Britt	McGill	WS	Ingham	Alberta	WR	Soden	RMC
LO	Cardiff	RMC	JR	Lamb	Carleton	GG	Stewart	RMC
PJA	Charlebois	RMC	PA	Leger	NB	TW	Strang	Alberta
JT	Cooper	Sask	JL	Leroux	CMR	VB	Suddaby	Sask
DARG	Courtemanche	Ottawa	HP	Martel	RMC	JJBR	Taillefer	Montreal
JCD	Crookston	Toronto	WA	Mersereau	NB	B	Tomlinson	Regina College (U of Sask)
RE	Deleeuw	RMC	DP	Nikiforuk	RMC	AD	Tupper	Mt Allison

With this issue the Bulletin mailing list includes 44 new ROTP officer cadets who have been accepted into RCEME since Jan 63. These cadets, who nearly all completed the ROTP Introductory Phase last summer, will commence Phase 1 training at RCEME School beginning in May this year. The Corps welcomes each one and wishes them all success in their academic studies and future careers.

WD	Armstrong	RR	JPJ	Girard	CMR	A	Nellestyn	RMC
DF	Boon	CMR	BCS	Glendenning	UNB	JC	O'Rourne	McGill
R	Bouliane	CMR	PAR	Glynn	RR	V	Pergat	McGill
JEJM	Bouliane	Laval	EC	Hague	CMR	JAM	Perreault	CMR
HA	Bruneau	CMR	LLA	Hellemans	McGill	RV	Potter	CMR
RJ	Bush	McGill	JDJP	Lafleur	CMR	RJ	Ridlington	CMR
MR	Cantin	CMR	GE	Lapointe	CMR	JMR	Rochon	CMR
JJR	Carrier	CMR	A	Leonard	CMR	GL	Sayant	RR
JNPF	Chevalier	CMR	JEJB	Lessard	CMR	RGJ	St Aubin	Assumption
FE	Collinge	CMR	CW	Lynn	Sask	HR	Stevens	McGill
JW	Davies	RR	RA	LeBlond	Ecole Poly	RG	Taylor	CMR
JCG	Dupont	CMR	PJJ	Marchildon	CMR	MMM	Trevors	UNB
TJ	Enright	CMR	PC	Marriner	Dalhousie	JNJA	Turcotte	Montreal
JJJY	Genest	CMR	HM	Merklinger	RMC	GR	Walker	RR
CJ	Girard	CMR	JGG	Nappert	CMR			

ANSWERS TO TECHNIC TEASERS

Did you enjoy the mental gymnastics? Have you a favourite "teaser" of your own? Let us know, maybe we can work up a permanent feature.

1. The empty bottle costs $2.50; the wine $42.50, that is $40.00 more than the bottle.

2. Exactly 111 1/9 pounds.

3. There are three ways: (1) 198, 199, 200, 201, 202; (2) 28, 29, ..., 51, 52; (3) 55, 56 ..., 69, 70.

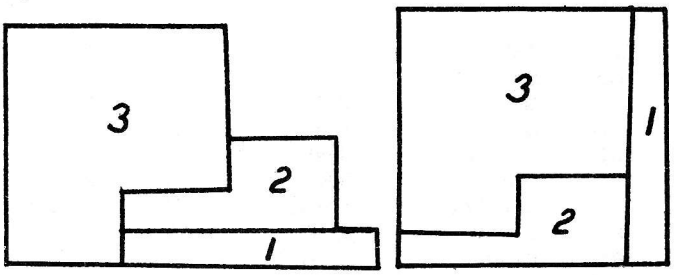
4. The fractions are 16/64, 19/95, 49/98.

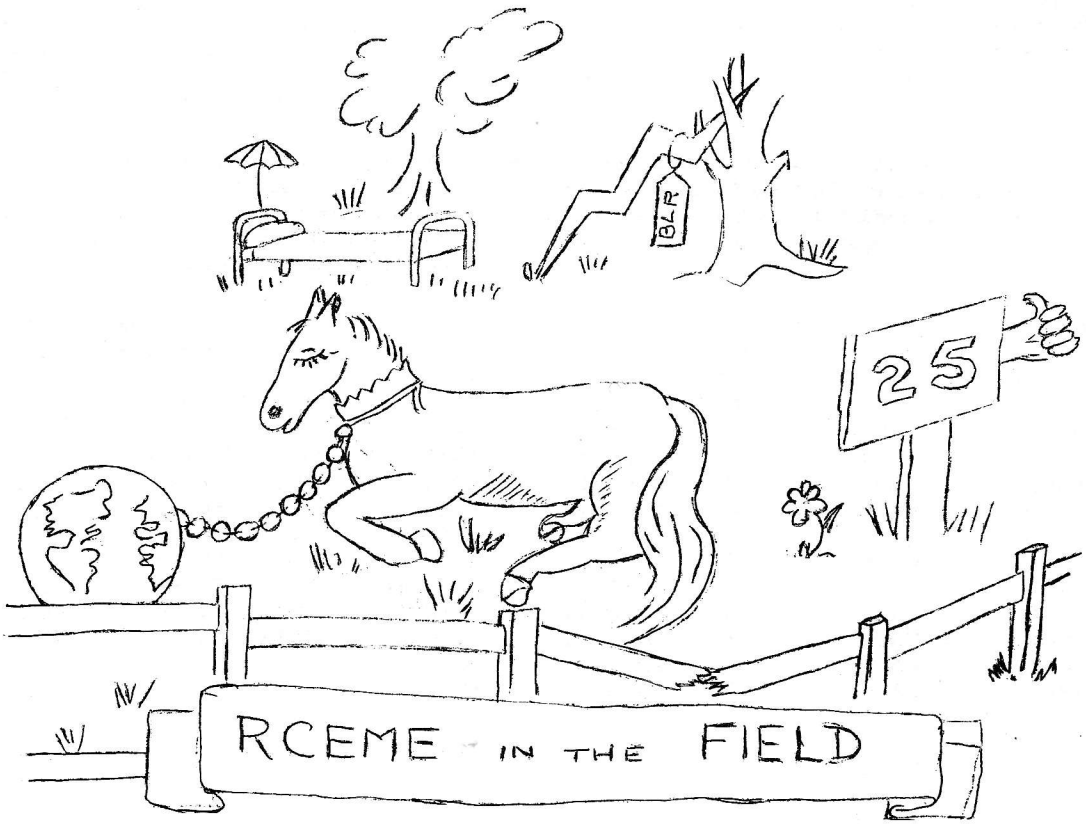
5. Three will be sufficient, because any combination of three socks will give one pair of the same color.

6. The cube of 642 is 264609288, the cube of 641 is 263374721, and so the difference is 1,234,567. The method is as follows:

$P^3 - Q^3 = 1234567$
$(P - Q)(P^2 + Q^2 + PQ) = 1234567$
Let $P - Q = 1$ then $P = Q + 1$
or $3Q^2 + 3Q + 1 = 1234567$
$3Q^2 + 3Q - 1234566 = 0$
$Q^2 + Q - 411522 = 0$
This must be the product of two numbers differing by 1 and the rest is easy.

7.





-Cfn HE Knight, 16 Coy